EDITORIAL

Changing Trends

JUST now the automotive industry does well to look carefully at general business conditions as well as at field reports of its own activities when attempting to peer into the immediate business future. Particularly the opinions of bankers and financial men may receive attention in view of the rising discount rate and the large quantity of time payment paper in the hands of banks and finance companies.

One prominent financial authority stated his belief the other day that anything in the nature of a decline in industry might mean considerable trouble for banks as well as for finance companies because of the large amount of times sales paper held by the former and the unusually large amount of unpaid-for merchandise of various kinds in the hands of the public.

An interesting bank view of the situation is expressed in the most recent Cleveland Trust Co. Business Bulletin which says: "The most important fact of the current business situation is that exceptionally easy money is becoming a thing of the past. For more than a year now short time interest rates have been slowly but steadily advancing. They are now no longer truly low. . . . *This does not mean that we are on the verge of a credit stringency or a business recession, but it does mean that one of the controlling factors in the business situation is in the process of a most important change.*

London Bus Regulation

A SHORT time ago a bill was passed called the London Traffic act which, among other things, provides that when a license has been granted a bus line, on the condition that regular scheduled service shall be maintained, a fine may be imposed up to £5 for the first failure to maintain schedules and suspension of the license may be the penalty for subsequent offences. The bill provides also that if failure to keep to schedule is caused by "accident or other unavoidable cause or by stoppage of work caused by an industrial dispute" fines will not be imposed.

The first prosecution under this act was made recently and fines and costs were imposed upon owners, drivers and conductors of two buses which did not keep to schedule time. The defence offered was that engine trouble developed and the men had to eat their breakfast after repairs were made. The magistrates held this as being neither accidental nor unavoidable.

This decision sets the precedent that ordinary engine troubles will not constitute sufficient reason for overrunning schedules, so that the bus owners will be compelled in their own interests to make frequent and careful inspections of their vehicles in order to forestall, if possible, any operating defects.

On the whole this law seems to be more strict than the conditions warrant. There are so many things which may tend to delay bus service which, although quite out of control of the bus owner, may under the precedent set up be considered neither accidental nor unavoidable. Certainly the older forms of transportation in this country would often have trouble under such ruling.

Automobile "Copy"

IN a recent issue of a popular weekly, 13 makes of automobiles were advertised. One advertiser contented himself with a concise description of the essential features of his product and let each reader estimate for himself its relative worth. Another manufacturer said his purpose was to "always make them finer" and gave some information concerning his production and inspection methods to bear out that statement. A third advertisement included a few details of performance and comfort features of the car. The other 10 advertisements consisted of general claims of superiority for the particular car advertised over all others with no supporting data and no information concerning the features of the car in which a prospective buyer might reasonably be expected to be interested.

We sometimes wonder just how many actual sales are strongly influenced by this last type of copy. It appears problematical that any person will believe the unsupported claim of the manufacturer of a car selling for, possibly $1000 that his car is the best in the world, or some other extravaganza. The reader knows that all of these statements can not possibly be proved unless he knows from his own experience the worth of any particular car, hasn't such advertising had a tendency to make him question all statements made in all automobile copy?

The automotive industry is not the only one by any means that makes use of extravagant claims in its advertisements. The condition seems to be common everywhere.

Distinction in advertising is a much sought after goal. Since many other industries are using methods of which Barnum was the greatest exponent the automotive industry might make its advertising quite distinctive by making only such statements concerning its products as can be proved conclusively and which are proved to some extent at the time and place the statement is made.

The only excuse for much of the advertising copy used today in popular mediums is that it serves to keep the manufacturer's name and product before the public. This, however, is one of the chief functions of advertising and perhaps it is too much to expect the men who prepare the copy to accomplish anything more in the average case.

Our Industry Today

A. E. A. Merger Plan to be Meeting Topic

M. A. M. A. Schedules Project for Discussion at Montreal Gathering Next Week

NEW YORK, Oct. 1—The proposal to consolidate the Automotive Equipment Association and the Motor and Accessory Manufacturers Association as a step toward elimination of duplicate effort and expense will be one of the important topic to be discussed by the convention of the latter organization in Montreal Oct. 7-10.

This proposal was discussed at the A. E. A. convention at Colorado Springs in July. At that time President William T. Morris pointed out that such a combination would produce the strongest automotive association in the country, with a good credit department, a powerful voice in legislation, a greater traffic department and close contact with the National Automobile Chamber of Commerce.

The A. E. A. committee on this subject was instructed to proceed with the arrangements and report at the November A. E. A. convention in Chicago.

This committee has held several meetings with the M. A. M. A. committee and a report of the progress made is expected to be delivered by the latter committee at the Montreal convention.

The M. A. M. A. committee consists of C. E. Thompson, Thompson Products Co., Cleveland; Earl V. Hennecke, Moto-Meter Co., Long Island City; M. B. Ericson, Biflex Mfg. Co., and E. P. Chalfant, Gill Mfg. Co., president of the M. A. M. A.

The A. E. A. committee includes Mr. Morris and N. F. Ozburn, Ozburn-Abston Co., Memphis; F. B. Caswell, Champion Spark Plug Co., Toledo, and Arthur Storz, Storz-Western Auto Supply Co., Omaha.

Air Reduction Buys Business

NEW YORK, Sept. 29—Following purchase of the carbide business of the Gas Tank Recharging Co., of Milwaukee, Wis., including acetylene plants in that city and Bettendorf, Iowa, and a carbide plant at Keokuk, Iowa, the Air Reduction Sales Co. has created a new district with office in Milwaukee, in which city an Airco oxygen plant has been in operation for some time.

The new district is in charge of J. S. Strate, and territory comprises parts of Wisconsin, Michigan, Illinois and Iowa. There is maintained at this office, in addition to supplies of Airco oxygen, acetylene and Airco-National carbide, a complete stock of apparatus and supplies.

Report Dodge Bros. Has Financing Plan

PHILADELPHIA, Oct. 1 — Dodge Bros., Inc., has entered into an agreement with the Commercial Investment Trust, of New York, for the financing of Dodge sales on the time payment plan, according to information received here.

Details of the arrangement are not available at the present time, but the plan is described as an interesting development of the current tendency for automobile maufacturers to exercise a greater direct influence on the time payment delivered price.

G. M. Plans New Oakland Model

NEW YORK, Sept. 29—General Motors Corp. announces that it is planning a new automobile to be produced and distributed by the Oakland division as companion to the present Oakland six.

At the General Motors offices it was said that the plans had not advanced sufficiently to make public prices and specifications of the new car or the field it will cover.

Space for producing the new car is available in the Oakland factory at Pontiac, Mich., because the Fisher Body Co. has erected a $2,000,000 building there in which to build all Oakland bodies. Previously these bodies were built at the Oakland factory.

Willys-Knight Change

TOLEDO, Oct. 1—Four-wheel brakes similar in operation and construction to those employed on the six-cylinder model announced Jan. 1, 1925, are now fitted on the four-cylinder Willys-Knight cars effective, it was announced today by Willys-Overland, Inc.

All models on the smaller chassis will be regularly equipped with the new brakes and included in the present list price, there being no extra charge for the front wheel brakes.

DUCO SERVICE OFFERED

WILMINGTON, DEL., Sept. 28—E. I. du Pont de Nemours & Co., Inc., announce that a Duco Color Advisory Service for the use of automobile manufacturers, which will bring to users of this finish the latest in colors and combinations, has been established under the supervision of H. Ledyard Towle, portrait painter, mural decorator and instructor, who has won several art prizes.

Willys and Nash to Talk Export

Other Leaders of Industry Will Address Fall N. A. C. C. Meeting

NEW YORK, Sept. 30—Planning for expected large increase of business in the foreign field, leaders of the automobile industry will map out export programs at the fall meeting of the National Automobile Chamber of Commerce, on Oct. 8th.

John N. Willys and C. W. Nash will take part in the discussion relating particularly to motor cars. M. L. Pulcher, president of the Federal Motor Truck Co., will outline the problems in export marketing of motor trucks.

Among other officials on the program will be: H. H. Hills, Packard; E. C. Morse, Chrysler; Percy Owen, Dodge Brothers; George F. Daniels, Locomobile; Sid Black, Cleveland; J. H. Dreibelbis, General Motors.

The meeting is preliminary to the Second World Motor Transport Congress to be held in New York, January 11-18, 1926.

Subjects to be Discussed

The topics include:

A. What Can Be Done to Offset Sales for financing of wholesale export trade; Obstacles in way of retail sales on time payments abroad; and general means for solving financial problems in exports.

B. How Can Costs for Delivering Automobiles to Foreign Destinations Be Reduced?

Discussion will center on needs of according preference on export over domestic shipments to obtain greater turnover by dealer; Elimination of boxing; Facilitating of export service and general items entering into landed costs abroad.

C. How Can Credit Facilities to Encourage Larger Volume of Exports Be Provided?

Discussion will take in developments Resistance From High Taxation on American Cars Abroad?

Under this heading will be discussed solutions for high taxation through change in engine design; Foreign assembling plants; Government policy; N. A. C. C. co-operation with Government and change of policy in commerical treaties.

D. What Promotional Work Should Be Undertaken to Stimulate Demand Abroad?

Proposals will be considered for stimulating of demand abroad through efforts of individual manufacturers and through co-operative efforts in motor transport congresses and other promotional activities.

August Automotive Exports Up 100%

Cars and Trucks Show Huge Increase Over July—Parts Lose Slightly

WASHINGTON, Oct. 1—A gain of more than 100 per cent in American exports of cars and trucks in August over July is shown in preliminary figures obtained from the Department of Commerce. Unit assemblies showed a slight drop, but in this, as in virtually all the leading automotive lines of export, a huge gain over the corresponding period a year ago is revealed.

Foreign shipments of passenger cars in August, 1925, totaled 26,516 units, against 16,567 in July of this year, and 12,218 in August, 1924. For the eight months ended August 31, 1925, there were exported 161,253 passenger cars, against 102,456 in the same period of last year.

An almost equally striking gain is revealed in the truck and bus figures, which totaled 6,724 in August this year, against 4,292 in July, and 2,353 in August, 1924. For the first eight months of the year, foreign shipments totaled 34,310, against 18,676 for the corresponding period a year ago.

In the parts group, exports of unit assemblies declined from 14,061,098 in July, to 13,704,402, in August, but the latter figures were more than 60 per cent above the August, 1924, total of 8,086,446 pounds. For the year to August 31, the total was 160,958,245 pounds, against 189,248,919.

Single Seater Bodies at Next Grand Prix

PARIS, Sept. 20 (*by mail*)—Single-seater bodies will be admitted in next year's Italian Grand Prix 500-mile race for 91½-inch cars, irrespective of any decision taken by other European clubs, according to a statement made by Arturo Mercanti, general manager of the Monza track. This decision was taken as the result of Duesenberg experience in Italy. It was proved that, under European conditions, the narrow type American body does not give any speed advantage; on the other hand, it allows the car to be better balanced, and it places the driver in a safer position.

The French club, while limiting the crew to one man, maintains that there must be two seats side by side, which of necessity puts the driver out of the center line. This rule makes it difficult to secure interchange of cars and drives between Europe and America. It is understood that at the October meeting of the International Racing Board, to be held in Paris, Italy will make an effort to convert other national automobile clubs to the single-seater rule.

PERCY OWEN
New Director of Foreign Sales
Dodge Bros., Inc.

Moon Motor Produces Diana Phaeton Model

ST. LOUIS, MO., Sept. 29.—The Moon Motor Car Co. has started production on a new five passenger phaeton model of the Diana, priced at $1895.

Instead of the usual molding the body panels have been offset at approximately the point formerly occupied by the molding. The offset is worked over the cowl and hood forming an arrow head with its apex at the rear end of the radiator shell. At this point it spreads out into a three-quarter inch line running down the front edge of the hood.

The sides of the body have been raised, resulting in lower appearance, but maintaining the same head-room. The body has also been widened, giving roomier and wider seats.

The body is finished in two-tone duco, the offset panel being finished in sage green, while the lower part of the body and hood is in French gray. This color combination is neutralized by a quarter inch green stripe which runs along the raised portion of the body and hood.

The equipment of the Diana phaeton includes heat indicator on the instrument board, a light control lever on the steering column, and a Diana statuette on the radiator cap.

Milton Brings Small Car

PARIS, Sept. 20 (*by mail*)—Tommy Milton, returning on the French liner "France," is bringing with him two Peugeot runabouts of a type common in France, having a four-cylinder engine of only 40 cubic inch piston displacement. While in Europe, Milton was impressed with the results obtained with small automobiles, which are showing themselves handier and faster on city streets than bigger and more powerful cars. He selected the Peugeot, which has a track of 37 inches and a wheelbase of 89 inches, as being the smallest of Europe's diminutive cars.

Owen Joins Dodge as Sales Director

Former Government Official to Have Charge of Export Business of Company

DETROIT, Sept. 29—Percy Owen, chief of the automotive division, United States Department of Commerce, will join Dodge Bros., Inc., Oct. 1, as director of foreign sales. Announcement of Mr. Owen's appointment was made by F. L. Sanford, general sales manager of the corporation.

Mr. Owen is known throughout the United States and abroad for his long and important activities in the automobile industry and as an official of the Department of Commerce. His entry into the automobile industry dates to 1899. For twelve years he was dealer, branch manager, importer and Eastern sales manager for Winton, Bianchi (Italian) and Chalmers cars. In 1912, he became general sales manager and director of the Chalmers Motor Car Co., Detroit. In 1915, he was vice-president of the Saxon Motor Car Co., and from 1916 to 1924 was president and general manager of the Liberty Motor Car Co.

In Government Post

At this time he joined the Department of Commerce, and, in the capacity of chief of the Automotive Bureau, has served on a number of important commissions. Last winter he was the official representative of the United States at the International meeting of the Central Council of Automobile Tourism in Paris. He has investigated the automobile industry in Europe on behalf of the United States, visiting nine countries, inspecting all the principal automobile manufacturing plants and conferring with various government officials. In addition to his position as chief of the bureau, Mr. Owen is chaiman of the following Department of Commerce committees: Pan-American, Foreign Exhibits, Highways.

For several years, Mr. Owen was president and director of the New York Automobile Association and treausrer and director of the National Association of Automobile Manufacturers. The export business done by Dodge Bros. has shown a yearly increase for many seasons and now constitutes a major factor in the company's affairs. Exports in the first six months of 1925 were 54 per cent greater than the exports for the first half of 1924.

J. J. Palmer continues in his present capacity as manager of export sales.

Houdaille Production

BUFFALO, N. Y., Sept. 29—Production of Houdaille shock absorbers for the first eight months of 1925 showed an increase of 35 per cent over the corresponding period of last year.

Automobile Salon Plans Annual Show

Nineteen Chassis, Representing Six Countries, Will Mount Custom Bodies

NEW YORK, Oct. 1—American and foreign custom coachwork makers will offer the latest products of their art at the Twenty-first Annual Automobile Salon to be held at the Hotel Commodore here Nov. 15-23. It is predicted that the new styles will tend strongly to contrasting colors in brilliant hues, rather than the combined and harmonizing shades that have come into general use of late years.

The carossiers exhibiting at the Salon are Blue Ribbon, Brewster, Brunn, Derham, deCausse, Dietrich, Fisher, Fleetwood, Holbrook, Judkins, Le Baron, Locke, Merrimac, Rollston and Willoughby. Nineteen chassis, representing six nations, will mount the custom bodies of the designers. They include Amilcar, Brewster, Cadillac, Cunningham, Duesenberg, Franklin, Isotta-Fraschini, Lancia, Lincoln, Locomobile, Marmon, Maybach, Mercedes, Minerva, Packard, Pierce-Arrow, Renault, Rolls-Royce and Wills-Sainte Claire.

A new rule of the Salon limits to twelve the number of chassis of any one make which may be exhibited.

Hardwood Business Booms in Southeast

ATLANTA, GA., Oct. 1—Automobile and body manufacturers in Northern and Central Western territory, apparently are contemplating active production this Fall, according to reports of larger lumber manufacturers and wholesalers in the Atlanta and other leading lumber markets of the Southeast. An unusual number of large orders have been placed by these industries within the last two weeks, and buying is even heavier than it was a month ago. Buying of hardwoods by the automotive industries was the most important feature of the weekly lumber reports of most of the larger lumber centers in the Southeast the final week of September, while inquiries from the same source had also increased materially, indicating that there will be little or no let-up in this demand in October. Prices throughout the list are stable, with a general tendency upward.

Kissel Announces Many Price Cuts

HARTFORD, WIS., Sept. 28—The Kissel Motor Car Company has announced price cuts ranging from $100 to $200 on all of its six-cylinder models, except the five-passenger Brougham Sedan and the five-passenger Brougham, and also price cuts on the eight-cylinder Enclosed two-passenger Speedster De Luxe Victoria. In addition a four-passenger Enclosed Speedster and a De Luxe edition of the same model have been added to both the six and eight-cylinder lines.

Following is a list of the models affected by the recent price cuts together with old and new prices:

Model	Old Price	New Price
Kissel 55		
2-p. Speedster	$1895	$1795
4-p. Speedster	1995	1895
2-p. Enc. Speedster	2285	2085
4-p. Tourster	1895	1795
5-p. Phaeton	1685	1585
7-p. Touring	1785	1685
4-p. Coupe	2185	2085
5-p. Victoria	2285	2185
De Luxe Models		
2-p. Speedster	$2185	$2085
4-p. Speedster	2285	2185
2-p. Enc. Speedster	2785	2585
4-p. Tourster	2085	1985
5-p. Phaeton	1885	1785
7-p. Touring	1985	1885
4-p. Coupe	2585	2485
5-p. Brougham Sedan	2685	2485
7-p. Sedan	3285	3085
Berline Sedan	3385	3185
Victoria	2685	2485
Kissel 75		
2-p. Enc. Speedster	$2585	$2485
De Luxe Victoria	2985	2885

Farming Equipment Sales Show Increase

ATLANTA, GA., Oct. 1—Another substantial increase in tractor and power farming equipment sales in the southeastern territory is noted in the current monthly review of the Federal Reserve Bank of Atlanta, just released for publication, and covering conditions in the district in August. A gain of approximately 50 per cent in the volume of sales in August, compared with the same month last year, is shown in the report of the seven larger distributors of tractors and implements in this district, making the third consecutive month that the gain in sales over the same month of last year has equalled or exceeded 50 per cent, and the sixth consecutive month that a gain of 35 per cent or better has been shown. For the first eight months of the year—January to August inclusive—the average gain in tractor and equipment sales over the same eight months of 1924 has been about 40 per cent, making certain that 1925 will prove by far the biggest year in the history of the industry in South.

NEW GARDNER BROUGHAM

ST. LOUIS, Sept. 30—A new four-door brougham, priced at $1595, on the Gardner six-cylinder chassis, is now in production. It is finished in two-tone lacquer and has nickel-trimmed head and cowl lamps, nickel-plated radiator shell and balloon tires. All instruments including gasoline gauge and engine heat indicator, are grouped on the dash under a single glass panel and are indirectly lighted. The windshield is a one-piece ventilating type and, in addition, there is a cowl ventilator. Equipment includes snubbers all around, rear-vision mirror, automatic windshield wiper and stoplight.

Safety Movement Topic of Congress

National Safety Organization Hears Address by Prominent Men

CLEVELAND, Sept. 29—The importance of the safety movement in the United States was emphasized at the opening here this week of the Fourteenth National Safety Congress by the prominence of the speakers who inaugurated the program. Among the speakers are John Barton Payne, chairman of the Central Committee of the American Red Cross; Rear Admiral William S. Sims, U. S. N.; Edward S. Jordan, president, Jordan Motor Car Co., and Dr. F. Ritzmann, of International Labor Office of the League of Nations, Geneva, Switzerland.

More than one speaker referred to the 20,000 accidental deaths on the highways of the country last year, accounting for nearly one-fourth of the total of about 85,000 accidental deaths. The need for promoting any measures that will reduce the accident toll was urged by speakers, including representatives of the automotive industry.

Secretaries of sixty-two local safety councils launched a movement for compulsory inspection of motor vehicle brakes, as a safety measure, and the resolutions committee of the congress reported in favor of uniform traffic regulations throughout the United States and the licensing of drivers after adequate mental and physical tests. It was asserted that these measures would help reduce the accident hazards.

John Barton Payne Makes Address

Judge Payne, who was Secretary of the Interior in President Wilson's Cabinet, deplored the tendency of otherwise good citizens when on the highways to try to "get by" with utter disregard of such traffic laws and regulations and rights of others as interfere with their own convenience and desires. He attributed this in part to the inclination of many citizens, especially since the advent of prohibition, to obey and enforce only the laws they like. He believed a dangerous condition confronts the country when citizens undertake to select the laws they will obey and enforce, and accounts for much of the spirit of recklessness and selfishness that is the indirect cause of many accidents.

Mr. Jordan declared that, with the progress in automotive manufacturing, cars have been made safer and safer, until today it is rare that an accident can be attributed to any inherent weakness in the vehicle. In his opinion, the most important safety factors in driving are brakes, steering mechanism, the driver, vision and lights. Other important factors are ample power, ease of shifting gears, and sturdy wheels.

This evening members of the automotive and engineering sections were entertained at dinner by the National Lamp Works at its Nela Park plant.

Automotive Revenue Collections Gain

August, 1925, Shows Increase Over August, 1924, of Nearly $4,000,000

WASHINGTON, Oct. 1 — Internal revenue collections from the automtive industry for August, 1925, showed an increase of $3,936,108.95 over the month of August, 1924, according to computations just made public here by the Internal Revenue Bureau. The total August, 1925, collections are given as $13,213,295.28. The statistics show that the aggregate receipts of the Bureau for August, 1925, totaled $117,493,918.46 or $29,139,673.34 more than for August, 1924.

The bulk of the August, 1925, collection increases was accounted for in the classification, "other automobiles and motorcycles," this group rolling up $10,197,896.15 for August, 1925, as compared with $6,156,299.17 for August, 1924. Collections from "automobile trucks and automobile wagons" for August, 1925, were $557,603.28, as compared with $701,899.87, being the only classification to show a loss. Collections from "automobile parts and accessories," at $2,457,795.85 were practically the same as in August, 1924.

It is further shown that collections from the automotive industry for the period from July 1, 1925, to August 31, 1925, were $28,050,904.47, or $7,300,298.91 greater than for the same period in 1924.

Milwaukee Ford Plant

MILWAUKEE, Sept. 28—The Milwaukee plant of the Ford Motor Co. is operating at capacity again after a seven-week shutdown necessitated by preparations for introducing the new line of improved models. H. M. Buckley, manager of the Milwaukee branch, states that a daily output of 200 cars through the fall and winter months is contemplated. "Allowing for the shutdown," Mr. Buckley said, "our production thus far this year exceeds that of a year ago. We are now completing 153 cars a day in Milwaukee and expect to attain the 200 mark by Oct. 1."

WISCONSIN TIRE OUTPUT

MILWAUKEE, Sept. 30—Wisconsin tire and rubber plants will undoubtedly maintain full production for the rest of this year, judging from the strength of spot orders and future delivery business already booked.

Ask A.A.A. Sanction for Foreign Races

Italian Automobile Club Favors Change From Present A.C.A. Arrangement

PHILADELPHIA, Oct. 1—The Italian Automobile Club, at the next meeting of the International Association of Automobile Clubs, will support a move for transferring the sanction of American cars in foreign races from the Automobile Club of America to the American Automobile Association, according to cabled advices from Europe. The meeting is scheduled to take place within the next six weeks.

Sponsors of the plan for having the A. A. A. represent the American entries in foreign races recognize the value of the activities of the A. C. A. in other respects, such as aiding American automobile tourists abroad, and maintaining an interchange of courtesies with the foreign automobile clubs. They do not wish to change the situation in this respect. But they feel that for the sake of uniformity, and so that records made on American tracks under A. A. A. sanction may be recognized overseas, the suggested change be made.

Developments of the Week in Leading Motor Stocks

NEW YORK, Oct. 1—One must leave the field of fact and turn to that of fancy to account for the tremendous speculation which has been in progress in the motor group this week. Rumor, conjecture and hope, rather than concrete accomplishment, have been the stimuli which have resulted in sensational market movements. Yet not all of the stocks identified with the automotive industry have had a part in this speculation, nor has the market, as a whole, participated in it. The level of prices of many stocks and the unpleasant possibilities of the credit situation have overcome the psychology of speculative hysteria in many groups.

The credit situation became a more potent influence in the market. Thursday brought the usual report of an impending advance in the rediscount rate by the New York Federal Reserve Bank, a report which was not borne out by later action. This week has heard the same report but there are other factors to be considered by the Federal Reserve authorities than that of stock market speculation. This latter probably can be curbed, if the authorities deem such restraint necesary, by other measures than that of advancing the bank rate, and the possible effect upon the difficult situation in which Great Britain finds herself in attempting to maintain the gold standard must be given due consideration.

The decline in grain prices to the lowest levels of the year and the coincident decline in stocks of companies which are favorite speculations in Chicago give some indication of the methods being employed to reduce the collateral loans at the center. Assuredly, there is no hint of Federal Reserve Bank action at that center as being the cause of the declines recorded. This week's bank statements from Chicago, Boston and Cleveland should show considerable progress made in the reduction of this class of loans at these centers.

There were only the ever-present rumors of mergers and consolidations to account for the wild speculation in some of the motor stocks. Unquestionably, the speculative pools active in them have taken full advantage of an unusual situation and have exploited it to the full, but there is also evident large purchases by more substantial interests. Whether one accepts the details of the consolidations which Wall Street hears discussed glibly each day or not, it must be assumed that something of the kind is in prospect, and, in due time, the public will have knowledge of what companies are to consolidate, and upon what terms. Until then, rumor will govern.

Hudson Motors, General Motors, Chrysler Motors and Fisher Body were the outstanding features of the week. All of them soared to new high records and all were enormously active. There was a deal of pother too, at various times, in Packard Motor, where a stock dividend is rumored; in Pierce-Arrow and in Hupp Motors, earnings present and prospective being the reasons assigned for the activity in these stocks.

U. S. Rubber and Fisk Tire were the strongest features of this group. In the former, evidence of a turn in the crude rubber market at London was advanced as a reason for the buying, while in the latter satisfactory sales were the motive. Stewart Warner advanced on reiteration of reports of an increase in the dividend rate this Fall, and American Bosch Magneto had several periods of strength, based on new developments in the radio field, rather than on developments in the automotive industry.

Elsewhere, specialties afforded the principal activity and interest. Railroad stocks did little, despite the publication of earnings reports for August, even more favorable, generally, than those for July. The department store stocks, as a group, give every indication of anticipating the very large volume of business passing in connection with the approaching holiday purchasing.

—H. H. S.

First Fall Meeting of A. S. A. Held

Philadelphia Organization Discusses Service and Service Managers

PHILADELPHIA, Sept. 29—The first fall meeting of the Automotive Service Association was held last evening in the rooms of the Philadelphia Automobile Trade Association. Fifty-six service managers were present and the attendance was 78 per cent of total membership. Harry Tipper, sales manager, General Motors Export Corp.; A. V. Comings, editor of the Automobile Trade Journal, and James Collins, head of the Commercial Survey Department of the Chilton Class Journal Co., were the speakers.

Maintenance Division Prosperous

Collins, speaking on the subject of the "Business Side of Service," gave the maintenance-volume picture with figures showing that the money value of new car output for this year would be considerably less than would be spent in the maintenance division of the industry. Service and maintenance are entering the era of profit and since there is no used car factor, greater earnings through maintenance sales will be made with less effort than in selling new vehicles.

"More Money for Service Managers" was the theme of Comings' talk. It is difficult to realize a profit on service sales unless the service manager is of a calibre comparable with the best managers in the car sales department. To secure this type of manager, dealers must raise the standard of remuneration.

Used Cars Not Hurt by New Ford Models

MILWAUKEE, Sept. 30—Local automobile dealers do not believe that the demand for the new model Fords will have any appreciable effect upon the used-car market in this city, despite current rumor to the effect that indications point to the sale of several hundred thousand of the new models as soon as they can be made. "While the new Ford is much smarter in appearance, the changes are not radical enough to induce present Ford owners to trade in their old car for a new one immediately," said G. F. Nelson, sales manager of the Ford Company here. "We do not look for disruption in the used car market so far as our own cars are concerned. Most Ford owners will be satisfied with the old car until it is worn out and they are ready for a new one. The new models have been on the market for some time already and our dealers report no decrease in the sale of used cars."

Much the same opinion was expressed by George R. Linblom, of the Edwards Motor Co., Dodge distributors. "While it will be five or six months before we will know definitely just how the demand for used cars will be affected by the introduction of new Fords, it is an even bet that the market for used cars of all makes will continue to boom. There are two classes of buyers of lower priced cars, those who stick to the Ford and those who want a larger car. The latter will continue to purchase larger cars which can be obtained at a price not much greater than that of a new Ford."

S. A. E. Announces Meetings Schedule

NEW YORK, Sept. 30—The Society of Automotive Engineers has announced the schedule of meetings of the various sections of the society as follows:

October

1—Detroit Section——Testing Apparatus and the Methods Used in Conducting the Tests—O. T. Kreusser; visit to the Proving Grounds of the General Motors Corp., with inspection of the entire grounds and testing apparatus.
2—Pennsylvania Section — Excursion to attend the 7th annual meeting of the Army Ordnance Association, at Aberdeen, Md., Proving Grounds.
8—Indiana Section—Steam Cooling—A. Ludloy Clayden.
8—Milwaukee Section—Joint Meeting with Chicago Section.
8—Chicago Section—Joint Meeting with Milwaukee Section.
10—Southern California Section—Exhibition fights at Clover United States Aviation Field. Followed by papers by military and naval experts on various aeronautic subjects.
13—Buffalo Section—Philosophy of Weight Reduction—L. H. Pomeroy.
14—Dayton Section—The Use of Radio for Military Purposes—W. H. Murphy.
15—Metropolitan Section — Speeding Up Traffic Safely—John C. Long, Harold M. Lewis and Major Elihu Church.
23—Washington Section.

Murray to Make Bus Bodies

RACINE, Sept 30—Officials from the Murray Body Co., of Detroit, are expected to arrive here before the end of September to take over the big plant of the H & M Body Corporation, recently purchased by the Murray interests. Most of the workers in the plant have been laid off and while some of them have taken other positions, the majority are awaiting developments in connection with proposed immediate operation of the plant by the Murray Body Corporation.

The plant at Racine will probably be given over to the making of bus bodies in line with information given out at the time of purchase of the plant by Murray. It was stated then that the motor bus field presents an excellent opportunity for a body-making organization and one which the Murray corporation intended to make use of immediately.

A. E. R. A. Exhibits at Annual Meeting

Motor Buses, Parts, Equipment to Have Large Place in Show

PHILADELPHIA, Oct. 1—Exhibits of motor buses, parts and equipment will be larger than ever before at the show held by the American Electric Railway Association, in connection with its 44th Annual Convention at Atlantic City, Oct. 5-9. More than 200 manufacturers have taken in excess of 100,000 ft. of space, and of this 40 per cent will be occupied by the bus manufacturers and the companies making parts and equipment for the motor coaches.

Additional Space Required

Not only will Young's Million Dollar Pier be completely taken, but it was found necessary to provide a huge tent containing 20,000 sq. ft. of additional space, in Shelburne Court—a stone's throw from the pier—where double-deck buses, emergency repair trucks and other equipment too large to go on the pier will be shown.

In view of the fact that this affair is practically the only one of national character, with the exception of the Boston Automobile Show, at which motor buses are exhibited, all the latest developments in these lines will be on display. Indications are that more buses of the street car type will be seen than at previous shows. There will be new gas-electric buses and new motor bus models.

Plans Completed for Automotive Meeting

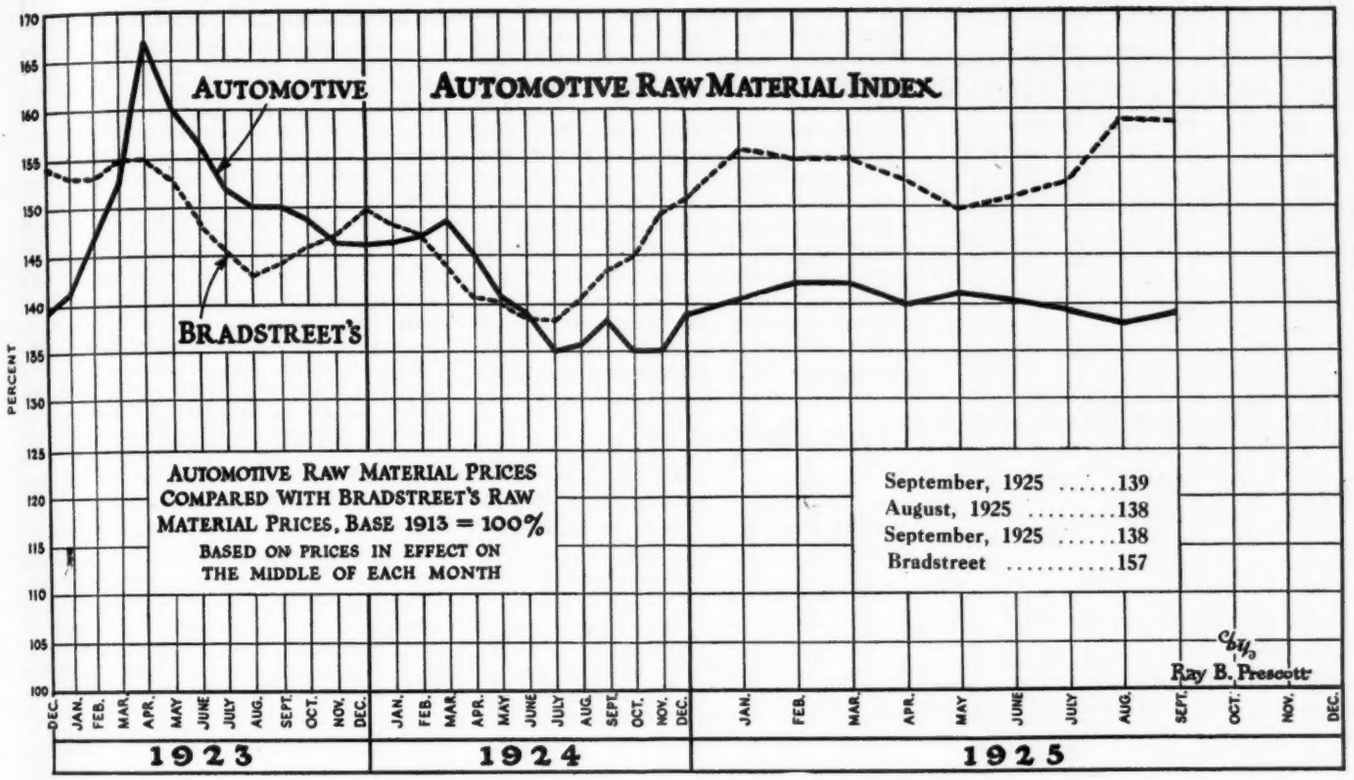
CHARLOTTE, N. C., Sept. 30.—Approximately 200 representatives of gasoline, tire, battery and accessories concerns are expected to attend the First Annual Convention of the North Carolina Automotive Service Association, at Greensboro October 20-21, according to Keeley A. Grice, of Charlotte, president of the association. Mr. Grice said every operator of a service station in this State, whether a member of the association or not, will be welcome at the meeting.

Alloy Steel Earnings

CANTON, OHIO, Sept 28—United Alloy Steel Corp. and its subsidiaries reports net income of $1,437,234 for the eight months ending August 31, equal, after taxes and depreciation and preferred divident requirements, to $1.60 per share earned on 800,000 shares of no par common.

Current assets, including $2,780,000 cash, were $16,554,000 and current liabilities $2,987,000. There were no bank loans.

September Material Prices Show Slight Increase



Budd Manufacturing Erects a New Plant

PHILADELPHIA, Sept. 30 — The Edward G. Budd Manufacturing Co., of Philadelphia, through its subsidiary, the Edward G. Budd Manufacturing Realty Co., is erecting on Charlevoix Avenue, Detroit, a plant for upholstering and finishing a substantial proportion of the bodies made in its plant here. The new factory will employ about 2,500, and will have available for working purposes 336,540 sq. ft. of floor space. The structure, which is being built on a tract of eleven acres, will be four stories high, 725 ft. long and 100 ft. wide. The cost will be about $1,500,000.

The Budd concern specializes in all-steel bodies for automobiles. In the eight months ended August 31, total sales were $14,642,708.

Government Orders Planes

NEW YORK, Sept. 28—Curtiss Aeroplane & Motor Co. has received an order from the United States Government for twenty-five pursuit planes and sixty-one engines, aggregating, according to the announcement, more than $1,500,000. The company's plants are operating at capacity.

TO DISCUSS AVIATION

LOS ANGELES, CAL., Sept. 23—Southern California section, Society of Automotive Engineers announces completion of plans for holding a meeting at the Army Club Rooms, Clover Field, Santa Monica, on October 10th in cooperation with the U. S. Army, Navy and Postal Air Service, to discuss development of aviation. Ethelbert Favary, secretary, says the subjects to be discussed by military, naval and civilian aviation experts include: Development of military aviation since the armistice; advances in airplane engines; superchargers and plane design.

Glycerine for Anti-Freezing

NEW YORK, Sept. 29—A national survey among users and suppliers of motor cars to ascertain the advantages of glycerine as an anti-freeze substance made evident the general belief that yellow distilled glycerine is preferable to other solutions as a satisfactory anti-freeze compound. The survey was conducted by the National Glycerine Service of the Proctor & Gamble Co..

Conditions were revealed which indicated the necessity for a solution which will meet the tests which ensure all-year-round driving.

OPEN MILWAUKEE BRANCH

NEW YORK, Sept. 29—Following purchase of the carbide business of the Gas Tank Rechanging Co., of Milwaukee, including acetylene plants in Milwaukee and Bettendorf, Iowa, and a carbide plant at Keokuk, Iowa, the Air Reduction Sales Co. has created a new sales district with office at 1296 Forest Home Ave., Milwaukee, in charge of J. S. Strate, district manager.

Los Angeles Plan Closed Car Salon

LOS ANGELES, Sept. 28.—One of the interesting automotive events of the year will be the second annual closed car salon at the Hotel Biltmore, here, during the four days commencing October 6, when some forty enclosed passenger automobiles, typical in each case of the individual line they represent, will be displayed by distributors and dealers.

In announcing the salon, President Robert S. Breyer, of the Los Angeles Motor Car Dealers Association, stated that the first salon, held at the Biltmore in March of last year had proved a wonderful success with an attendance figure of 20,000, but the committee in charge had set the dates of the salon in October for this year as being a more suitable season for displaying enclosed cars with the approach of Winter.

Each dealer or distributor will be permitted to display but one car of any individual make.

The committee in charge is composed of Lynn C. Buston, Chairman, J. S. Woollacott and H. E. Woodward, its members working closely with Burt Roberts, executive secretary of the dealer association, as manager.

PLANS ATLANTA AIR BASE

ATLANTA, GA., Sept. 28—Cornelius Vanderbilt, Jr., has under option in Atlanta a tract of land comprising some 11,000 acres for establishment of a commercial air base, development work to take about five years.

A. E. A. Merger Plan to be Meeting Topic

M. A. M. A. Schedules Project for Discussion at Montreal Gathering Next Week

NEW YORK, Oct. 1—The proposal to consolidate the Automotive Equipment Association and the Motor and Accessory Manufacturers Association as a step toward elimination of duplicate effort and expense will be one of the important topics to be discussed by the convention of the latter organization in Montreal Oct. 7-10.

This proposal was discussed at the A. E. A. convention at Colorado Springs in July. At that time President William T. Morris pointed out that such a combination would produce the strongest automotive association in the country, with a good credit department, a powerful voice in legislation, a greater traffic department and close contact with the National Automobile Chamber of Commerce.

The A. E. A. committee on this subject was instructed to proceed with the arrangements and report at the November A. E. A. convention in Chicago.

This committee has held several meetings with the M. A. M. A. committee and a report of the progress made is expected to be delivered by the latter committee at the Montreal convention.

The M. A. M. A. committee consists of C. E. Thompson, Thompson Products Co., Cleveland; Earl V. Hennecke, Moto-Meter Co., Long Island City; M. B. Ericson, Biflex Mfg. Co., and E. P. Chalfant, Gill Mfg. Co., president of the M. A. M. A.

The A. E. A. committee includes Mr. Morris and N. F. Ozburn, Ozburn-Abston Co., Memphis; F. B. Caswell, Champion Spark Plug Co., Toledo, and Arthur Storz, Storz-Western Auto Supply Co., Omaha.

Magneto Business Gains as Farmers Prosper

NEW YORK, Sept. 30—M. W. Bartlett, president of the Splitdorf Electrical Co., said recently:

"National prosperity, of course, starts with the farmer. We have felt the slow but gradual improvement in farm buying conditions by reason of the fact that our magnetos for tractor use are going out to manufacturers in volume more comparable to the volume of six years ago.

"What is even more impressive of this business trend is the fact that we are shipping magnetos in car load lots to one of the leading tractor manufacturers, and our general magneto business is 100 per cent greater this year than it was the corresponding period last year."

MEXICAN CAR SITUATION

SAN ANTONIO, Sept. 30—The automobile business in Mexico City is improving rapidly, according to reports from dealers there. The financial situation is better than it has been for many years.

This week William C. Benbow, distributor for Dodge Bros. products in Mexico City was in San Antonio buying accessories, parts, tubes, tires, etc. He declared sales for all lines of machines represented in Mexico, and especially Dodges, are increasing. He said, also, that the outlook for trade is better than it has ever been. Mr. Benbow said most sales in Mexico are for cash or cash and paper which can be handled easily.

William Mayfield, Studebaker distributor in Mexico City, was here last week. He reported business improving and the outlook for sales brighter. Mexico City dealers carry considerable lines of accessories, and this line of business is brisk.

Miller Rubber to Weigh Stock Split

AKRON, Sept. 30—A special stockholders' meeting will be called in the near future by directors of the Miller Rubber Co., to pass on a proposed split-up in the company's capital stock.

The par of the common shares will be either reduced or placed on a no-par basis. Rumors are that two new shares, probably of $50 par, will be issued for one of the old shares, but company officials say nothing definite has been decided.

Directors declared a quarterly dividend of 1½ per cent, but other dividend action was deferred, pending outcome of the stockholders' meeting.

In the first six months of 1925, Miller earned $32.81 a share on the $5,186,840 common stock outstanding, compared with $29.52 for all of 1924. Net profits for the half year were $2,048,343.

Speculation in rubber stocks has caused various Akron issues to make extravagant advances this year. Miller has risen 135 points, while General has gained more than 90 points, touching a new peak last week at 325. Firestone has jumped 40 points, and India, 70 points.

General Tire is now a $50 par stock, and at present prices is believed the highest rubber stock on the market. The old stock once sold at $900 a share.

AIR SURVEY FOR PORTS

SAN FRANCISCO, CAL., Sept. 30—An aerial survey of San Francisco Bay cities and ports, with a view to ascertaining, mapping and recording locations suitable for commercial airports, has been made by Capt. S. E. Moses, commander of the San Francisco-Hawaii flight project, and in charge of naval aviation in the Twelfth Naval District.

AIR EXPERTS TO MEET

NEW YORK, Sept. 28—Experts are to present latest information on airplane design, construction and operation at the national aeronautic meeting and dinner to be held by the Hotel Astor, during the afternoon and evening of Oct. 7, the day preceding the Pulitzer prize races at Mitchel Field, Long Island.

FINANCIAL NOTES

Dubilier Condenser & Radio Corp.—This corporation, for the year ended June 30, reports net income $253,189, equal to 83 cents a share on 304,170 shares of no par common. Balance sheet showed current assets $816,968 and liabilities $115,902, with net working capital $701,066 against $1,101,253 on December 1, 1924.

William Dubilier, president, noted serious curtailment in seasonal demand early this year, but added that since Dubilier inventory is of standard units, it was kept within normal quantities, thus avoiding losses from over-production and over-inventory which he says prevailed generally in the industry.

Dubilier sales in July, August and September exceed the same months last year and Mr. Dubilier says that radio set makers are showing greater conservatism in forward commitments, which will result in a more evenly sustained and prolonged selling season than last year.

Peerless Truck & Motor Corp.—Stockholders in this corporation have voted to transfer the property of the corporation in Richmond, Va., to the new corporation in Ohio. Peerless Truck & Motor formerly built trucks as well as automobiles, but discontinued the manufacture of the former several years ago. The change has been effected by an amendment to the Virginia charter, it being explained that there was no longer any necessity for a holding corporation, since the Peerless Motor Car Co. operated the only plant in which the holding company was now interested. It was further pointed out that a saving would be effected to stockholders, since the stock will be non-taxable in Ohio.

Automobile Equipment Mfg. Corp.—Stockholders of this corporation, designers and manufacturers of the balloon bumper, Chicago, have received the regular quarterly dividend of 8 per cent per annum on their holdings of preferred stock and also dividends of 15 per cent on common.

J. W. Suporter, general manager, reports a better month's sales for August than for July or June, in spite of the belief in automotive circles that August is one of the "off" months.

Moon Motor Car Co.—Returning on the "Aquitania" from a business trip abroad, Stewart McDonald, president of Moon Motor Car Co., said that earnings of that concern for 1925 would be about $8 per share, compared with $3.10 in 1924. Production would exceed 1924 by about 20 per cent, with approximately 10,000 Moon cars and 5,000 Diana models, and production in 1926 would be about 20,000.

Packard Motor Car Co.—This company has increased quarterly dividend rate on capital stock to 50 cents a share, placing the stock at a $2 annual basis, against $1.20 with extra dividends heretofore. The dividend just declared is payable Oct. 30 to holders of record Oct. 15.

General Motors Corp.—On September 12, the 36,585 common stockholders of General Motors received dividend checks for the third quarter of 1925.

The total number of General Motors common and preferred stockholders is now 58,118, compared with 60,414 in the preceding quarter.

Men of the Industry and What They Are Doing

McDonald Back From Europe

Stewart McDonald, president of the Moon Motor Car Co., said yesterday on his return from Europe aboard the Acquitania that his company would earn approximately $8 a share this year. Last year the Moon Co. earned slightly more than $3 a share, in the first 6 months of this year $4 a share and between $2 and $3 per share for the third quarter. Going into the last part of the year he predicted his company would earn about $2 a share.

The Moon company's plants will turn out approximately 15,000 cars this year, of which number 5,000 are Dianas. This is 20 per cent above last year's production. Mr. McDonald said he hoped that equivalent increase would be seen next year. He added that he did not believe there was any slump in the motor industry, except for the usual but slight seasonal slack.

While he was in Paris, Berlin and London, Mr. McDonald said he was greatly surprised to see the large number of Chrysler cars in operation on the principle thoroughfares. The Chrysler and Diana automobiles, declared Mr. McDonald, have been the outstanding features in the automobile industry during the last five years. He said it was remarkable how rapidly the Chrysler automobile was being sold abroad, and while over there having established agencies of his own in all European countries except Russia, he introduced the American sales method.

Rosenberg Elected President

A. H. Rosenberg, vice-president of the Motor Car Securities Corp., was elected president of the Central Automobile Finance Credit Association, at the annual meeting this month. The organization has a membership of twenty-eight firms writing more than a billion dollars a year in business throughout the middle West. It is affiliated with the National Association of Finance Companies and maintains headquarters in Chicago.

Other officers elected were S. J. Steinberg, vice-president; A. J. Deutschman, secretary; John B. Perlee, treasurer. Directors elected were: J. L. Nau, R. A. MacDonald, H. M. Lilly and John L. Little.

Mr. Rosenberg was on the board of directors before being honored with the presidency.

Roberts With Kokomo Automotive Mfg.

Joseph J. Roberts has been appointed direct factory representative of the Kokomo Automotive Manufacturing Co., Kokomo, Ind., for Michigan and Ohio. In this capacity, he will be in charge of all sales of Kokomo products, which include mirrors, windshield wings, transmission linings and checkers, and will sell to manufacturers exclusively. Mr. Roberts was formerly sales manager of the Herbrand Company, Fremont, Ohio, and prior to that was Detroit representative of the Bundy Tubing Co., Detroit.

Altenberg Engineer for Hoof

A. Altenberg, formerly chief engineer of Falls Motor Corp., Sheboygan Falls, Wis., is now chief engineer for John C. Hoof & Co., 157 West Illinois Street, Chicago. This concern has been making developments in replacement parts manufacture, and Altenberg is engaged in the supervision of this work.

Everson Promotes Sales

Chevrolet Motor Co. of Canada, Ltd., announces the appointment of E. A. Everson as assistant sales manager in charge of sales promotion.

Akers Leaves Dodge

F. H. Akers, for the last three years director of districts for Dodge Bros., has resigned, and will, on November 1st, be associated in an important executive capacity with one of the leading motor car companies of the industry.

Previous to his connection with Dodge Bros., Mr. Akers was for more than seven years an important factor in the sales organization of the Reo Motor Car Co.

Dick is Service Manager

R. H. Mulch, vice-president and general manager of Flint Motor Co., announces the appointment of Joseph R. Dick as service manager. Mr. Dick has had wide experience in such work with several other prominent automobile manufacturers, principally Chevrolet and Durant of Canada.

Knowles is Appointed

Worth C. Knowles, formerly associate editor of Motorcycling, Chicago, and more recently Southern California representative of Western Plumber, Pacific Laundry Journal and Western Baker, San Francisco, has been appointed publicity man for Harley-Davidson Motor Co.

Palmer is Vice-President

Fifth Avenue Coach Co. announces the election of Louis Hooker Palmer, formerly vice-president and general manager of the United Railways & Electric Co. and subsidiaries, including the Baltimore Transit Co., as vice-president and general manager of the Coach concern and the New York Transportation Co., which controls its stock.

Fisher Sails for Europe

Lawrence P. Fisher, president of the Cadillac Motor Car Co., sailed for a visit to Europe Saturday, and, before leaving, declared he was enthusiastic about conditions in the automobile business at the present time. He added that production of Cadillac cars would be speeded up immediately.

Burr Factory Manager

Houde Engineering Corp., 177-273 Winchester Ave., manufacturer of Houdaille (Hoo-Dye) hydraulic shock absorbers, announces the appointment of H. B. Burr as manager of factory equipment and manager of Detroit factory branch. He was formerly with the Remy and Klaxon divisions of General Motors.

Halloran Bank Director

Frank L. Halloran, head of Halloran Tractor Co., has been elected to the board of directors of the Exchange Bank and Trust Co. Mr. Halloran is widely known throughout the Tri-State in connection with the Holt caterpillar, for which his firm has the tri-states agency.

Rogers With Radio Corp.

L. G. Rogers, formerly manager of the Southern Radio Corporation, of Charlotte, N. C., has assumed his duties as southern representative of the Radio Corporation of America, with headquarters at Charlotte.

Hunt Vice-President

J. S. Hunt, general factory manager, Star car division, Durant Motors, Inc., has been appointed vice-president of manufacturing of the Star car division.

Mr. Hunt's headquarters will continue to be at the Elizabeth plant.

Hanford With Anglada

Frank B. Hanford has resigned as engineer for the T. N. T. Engineering Co., of Newark, N. J., and is now associated with Joseph Anglada, 250 W. 57th St., New York City.

H. H. Pete Promoted

Simultaneously with the introduction of the new Willys-Knight taxicab, Willys-Overland, Inc., announce the promotion of H. H. Pete from assistant sales manager to manager of the taxicab and commercial car sales department. Mr. Pete has held executive sales positions for a number of years and prior to coming with Overland was assistant sales manager of the Willys-Knight division of the Electric Auto-Lite Co.

Rubber Exchange in New York Approved

About 100 Representatives of Industry Vote for Organization

NEW YORK, Sept. 26.—With the chief objects of guaranteeing contracts and stabilizing prices about 100 representatives of the rubber industries, at a meeting called by F. R. Henderson, in the Reform Club yesterday, voted in favor of establishing an exchange to deal in rubber futures. Mr. Henderson obtained a State charter for such an exchange on June 17th.

A committee consisting of Mr. Henderson, chairman of the meeting, Charles T. Wilson of 82 Beaver street and W. E. Bruyn of L. Littlejohn & Co., is now consulting specialists in the operation of exchanges for the purpose of submitting organizational recommendations at another meeting to be called soon. The question of admitting other than rubber manufacturers and brokers will be decided later.

Exchange Would Steady Prices

Mr. Henderson believes that with such an exchange in operation the wide fluctuations in rubber prices during the recent months would have been prevented, and as a result of recent trip abroad he reports that rubber men in London and Liverpool are anxiously awaiting the organization of an exchange here.

The exchange is designed to furnish greater facilities in the purchase and sale of crude rubber and allied products, to establish equitable principles in business between members, to maintain uniform rules, regulations and usages, to standardize classification, to acquire, preserve and disseminate useful information and to decrease local risks.

Location of the exchange, somewhere downtown, will be decided later. The Cocoa and New York Produce Exchanges have invited the new organization to share their quarters but it is probable that the rubber exchange will prefer to establish its own home.

San Francisco to be Host to Highway Convention

SAN FRANCISCO, Sept. 28—The All-Western Road Show, accompanied by the conventions of half a dozen organizations interested in highways, will open here Nov. 9 for one week. The conventions and show will be held in buildings and tents covering a 25-acre area owned by the city. Automobile distributors here are negotiating for space for displays in and around this exhibition.

Chapters of the Association of General Contractors from Denver, Salt Lake, Portland, Seattle, Spokane, San Francisco, Los Angeles and Phoenix expect to have virtually their entire membership on hand for Contractors' Day, November 12. The Western Association of Highway Officials will hold its annual convention here Nov. 9. The Nevada Association of County Commissioners will attend the program for County Commissioners' Day, Nov. 11.

Nov. 10 will be Engineers' Day, and the annual convention of the Western Construction Equipment Distributors, the organization of the selling end of the industry, will be held Friday, Nov. 13. The Pacific Coast Sand and Gravel Association will hold its annual meeting on the same day.

Lee Tire Offices Leave New York

NEW YORK, Sept. 28—Lee Tire and Rubber Co. has moved its general offices from 27 West 60th street, New York City, to the concern's plant at Conshohocken, Pa. H. L. Pettingell, assistant sales manager, is left in charge of the New York branch office and John J. Watson, Jr., president, also remains in New York City.

Among the officials who have gone to Conshohocken are A. A. Garthwaite, vice-president and treasurer; William B. Dunlap, assistant treasurer; H. E. Field, sales manager; C. C. Gould, general credit manager, and H. J. Woodard, who was assistant sales manager in charge of the Republic division.

In future the business of the company will be directed from the general offices at the Conshohocken plant, on the first floor, whose offices have been enlarged.

Indiana Section of S. A. E. Meets Oct. 8

INDIANAPOLIS, Sept. 28—The Indiana section of the Society of Automotive Engineers will hold its first fall meeting the evening of October 8th at Hotel Severin, with A. Ludlow Clayton, chief engineer gas engine research, of the Sun Oil Co. as the chief speaker. He will discuss automotive steam cooling. Other experts who have experimented along this line are expected to take part.

The section is preparing its full fall and winter program of six meetings. George Briggs, Wheeler Schebler Carburetor Co., is chairman and Raymond Buckley, chief engineer of Robt. H. Hassler, Inc., is the new secretary. Fredrick E. Moskovics, president of the Stutz Motor Car Co. of America, Inc., is chairman of the meeting and papers committee.

FOX OCCUPIES BUILDING

PHILADELPHIA, Sept. 30—The Fox Automotive Products Corp., Philadelphia, has just moved into its new building at 18th St. and Widener Ave. It occupies a ground space of 90 by 162 ft., and is four stories in height. Modern brick and glass construction has been followed throughout. There is a private siding on the Reading Railroad.

Finds Gasoline Up to Standard

Bureau of Mines Completes Survey Showing Specifications Are Maintained

WASHINGTON, Oct. 1.—Results of the twelfth semi-annual motor gasoline survey recently completed by the Bureau of Mines, Department of Commerce, indicate that the average volatility of motor gasoline now being marketed throughout the United States falls well within the limit of Federal Government specifications. The investigators found that the average gasoline sold today is about the same quality as that sold in the summer of 1924. As would be expected, gasoline sold in the summer of 1925 shows a slight decrease in volatility as compared with the gasoline marketed last winter.

A slow but certain tendency towards uniformity among the various gasolines marketed has been manifested since 1917. In arriving at this conclusion, the 10 per cent of the gasoline with the lowest "end points" and the 10 per cent with the highest "end points" were selected, and the average "end point" computed for each of these groups, the difference between these figures having been taken as an index of the trend toward uniformity.

Seasonal Differences

There has always been some difference between "winter" and "summer" gasoline, the Bureau of Mines points out, gasoline marketed during the winter being somewhat more volatile than that sold during the summer.

The average specific gravities of gasoline from all cities, with the exception of Denver and San Francisco, were found to be heavier than those of the gasolines sampled in the July, 1924, survey.

The cities in which gasoline samples were collected for purposes of testing were New York City, Washington, Pittsburgh, Chicago, New Orleans, St. Louis, Bartlesville, Okla., Denver, Laramie, Wyo., and San Francisco. These cities were chosen as being representative of the more important gasoline marketing territories, and it is believed that the samples obtained are indicative of the quality of gasoline marketed throughout the United States.

Detailed results of the survey have been published in Serial 2703 by I. N. Beall, H. M. Thorne and John Devine, junior chemists, copies of which may be obtained from the Bureau of Mines, Department of Commerce.

Firm Name Changed

WILMINGTON, DEL., Sept. 28.—The Ford Motor Co. of Brazil has certified to the Delaware secretary of State that it has changed its name to Ford Motor Co., Exports, Inc.

Merger Plans Held Up in California

Fageol, Hall-Scott, Brill and Car and Foundry Scheme Delayed

OAKLAND, CAL., Sept. 29—The corporation laws of California appear to be the snag on which the merger of the Fageol Motors Co., Hall-Scott Motors, Inc., the American Car and Foundry Co. and the J. G. Brill interests is temporarily hung up, according to an announcement by officials of the Fageol concern.

The two purchasing companies, American Car and Foundry and the Brill Company, had planned to organize the Fageol and Hall-Scott interests into one California corporation, subsidiary to the two eastern firms. Into this plan entered the issuance of non-voting preferred stock, to be taken by American Car and Brill interests, and of no-par-value common stock to the amount of 150,000 shares with which the Fageol stockholders were to be paid for their present stock.

New Plan is Required

The state of California here stepped in with the ruling that new corporations having non-voting preferred stock and no-par-value common should not be permitted to file their articles of incorporation. This necessitated an entirely new plan for the merger and this plan is now being worked out in the east.

Aside from this delay, Fageol stockholders have not yet voted the necessary two-thirds confirmation of the sale agreement between the Fageol directors and the representative of the American Car and Foundry Co. and the J. G. Brill Co. It is generally presumed that the agreement will be confirmed by the stockholders. The San Francisco firm of industrial engineers which is making an appraisal of the Fageol plant.

Fageol's Possible Plans

It is understood that if the stockholders do not approve the merger, the Fageol Company will try to purchase Hall-Scott motors. Fageol officials claim that the Fageol bus and truck engine is of their own design, and merely manufactured by Hall-Scott Motors.

In case this plan falls through, the Fageol interests announce that they will float a bond issue and errect a manufacturing plant of their own, building the Fageol engine for themselves.

Wisconsin Dealers Are to Pay Gasoline Taxes

MADISON, WIS., Sept. 29—In a ruling by Solicitor of Internal Revenue, the Wisconsin gasoline tax is held to be imposed on the dealer and not on the consumer, so that only the dealer can take the deduction for it in his income tax returns, according to M. L. Seidman, tax expert of Seidman & Seidman, Certified Public Accountants, New York City. The fact that the dealer adds the amount of the tax to the price of the gasoline and charges the consumer specifically for the tax does not alter the situation, Seidman explained. In such instances, the consumer merely reimburses the dealer, but the tax as a tax is paid only by the latter.

Accordingly, an owner of a motor vehicle can not deduct in his income tax return amounts collected from him by a dealer under the Wisconsin gasoline tax law, unless the gasoline is purchased for business purposes, and then it is deductible not as a tax but as an ordinary and necessary business expense. The dealer may deduct, on his return, the amounts paid the state under the gasoline tax law, for as to him the payments constitute tax payments.

Luxor Cab Concern to Enter Motor-bus Field

FRAMINGHAM, MASS., Sept. 28—The Luxor Cab Manufacturing Corp., is about to enter the bus field. Plans are being made for the national launching of the Luxor "Utopian." These plans include advertising, sales, production and delivery programs, investigations and maping out bus routes, and launching of bus operating companies. The Company will follow the policy established as regards Luxor cabs by protecting franchises given to operating companies.

The Luxor bus and taxicab will be a harmonious standardization to the operator. Standardization of equipment will mean that the problem of service will be solved by one organization and not by many. Final plans, specifications and sales policy details will be announced soon.

Morris Motors Output Gains Since the War

LONDON, ENGLAND, Sept. 20 (*by mail*)—Figures relating to the output of Morris cars for each year ending Aug. 31 since 1919 have just been announced. They are as follows:

1920, 357 cars; 1921, 2927; 1922, 5156; 1923, 17,286; 1924, 27,551; 1925, 48,717.

Production plans for 926 aim at 65,000 cars, for, though the output of the Coventry plant in power-units is now approximately 1500 per week, a portion goes into the Morris trucks, of which two types are now made, viz., for 1350 lbs. and 2250 lbs. Extensions of that plant now in hand will give an output of 2000 units a week.

GASOLINE TAXES STUDIED

MADISON, WIS., Sept. 30—A national convention of State officials charged with administration of gasoline taxes in the various States will probably be called at Madison, Wis., this fall. Soloman Levitan, state treasurer of Wisconsin, has invited all State officials interested to attend such a meeting at Madison, and out of thirty-five replies received thus far, thirty-one executives favor the parley. Forty-four States in the Union have gas taxes.

Sound Time Terms Studied in Survey

National Association of Finance Companies to Send Out Questionnaires

CHICAGO, Sept. 28—The National Association of Finance Companies is conducting an extensive survey to determine what are fundamentally sound credit terms in the time payment plan of selling automobiles. C. C. Hanch, general manager, has sent a questionnaire to all companies known to be in the business of financing automobile sales.

Mr. Hanch announces that at the annual meeting of the Association in Chicago, Nov. 17, the conclusions drawn from the analysis of the answers to this questionnaire will be made public. Finance companies sending answers are assured that no details of their individual businesses will be made public, but only on the average facts determined in the analysis of the returns.

Among the questions asked are:

Average loss per repossessed car which had sixteen to eighteen equal monthly payments. On new cars, the percentage of repossessions when down payment was one-third of cash price or 30 per cent of time selling price, and when down payment was less than 25 per cent of time selling price. On used cars, percentage of repossessions when down payment was 40 per cent of cash price or 37 per cent of time selling price and when down payment was less than 37 per cent of time selling price. Percentage of used car paper handled. Percentage of total used car paper handled with recourse. Percentage of paper calling for more than twelve equal monthly payments. Percentage of paper with 35 per cent or less down on used cars and 25 per cent or less down on new cars.

S. FALENDER BUYS PLANT

INDIANAPOLIS, Sept. 30—The plant of the defunct Midwest Engine Co. has been sold to Samuel Falender of S. Falender & Co., and a syndicate, for $525,100. The holdings of the company occupy several acres and some of the large buildings of the plant were thoroughly modernized during the war, when the company was manufacturing various types of gasoline engines for war purposes. Originally, it was the home of the Atlas Engine Co. and later the Lyons Atlas Co. Finally it was merged with the Hill Steam Pump Co. and expanded into the Mid-West Engine Co., which made several products, including Diesel engines, large marine motors, the Utilitor and the line of Hill Pumps.

It is understood that the new syndicate bought the large property as an investment and hopes to interest some truck building company to take over the property. The bondholders of the old Atlas Co., with about $940,000 of this paper, will receive the greater part of the purchase price.

Charges Aluminum Co. Breaks Law

Federal Trade Commission's Complaint Denied, Company Blaming Middlemen

WASHINGTON, Sept. 28—The Federal Trade Commission's announcement that it had filed a complaint against the Aluminum Co. of America, charging practices alleged to lessen competition and tending to create an aluminum monopoly, has interest for the automobile industry because of the allegation that the company holds 75 per cent of the stock in the American Body Co., which manufactures aluminum bodies for automobiles, and 64 per cent of the stock in the Aluminum Manufacturers, Inc., which makes sand castings for automobile parts.

Among the charges against the Aluminum Co. of America is one that this concern has entered into contracts and agreements for automobile bodies and other fabricated aluminum products and that the effect of these agreements was to lessen competition and tend to create a monopoly.

It is charged that the respondent since March, 1923, has produced over 95 per cent of the virgin sheet aluminum manufactured in the United States.

Aluminum Co. Answers Charges

The Aluminum Co. of America has issued a denial of the charges, stating that the United States Smelting & Refining Co. is not at present its only competitor in the manufacture of sheet aluminum. Continuing, the formal statement said:

"It is particularly denied that if it had been true (which it is not) that any such sales or practices as those referred to (to lessen competition and create a monopoly) either had in the past or were now in existence, such sales or practices could have any effect up on competition or trend in any way to create a monopoly . . . .

"It has been the practice (of the company) to give to consumers of aluminum the lowest possible prices and . . . whatever complaints have been made, are largely, if not wholly, confined to complaints of middlemen, who naturally have found their profits more or less interfered with by the policy of the company."

GRINDING WHEEL SIMPLIFICATION

WASHINGTON, Oct. 1—With representatives of the General Motors Corp. and the Packard Motor Car Co. taking a prominent part, elimination of 459,000 out of 712,000 sizes, varieties, and types of grinding wheels was adopted here this week at a general conference under the auspices of the Division of Simplified Practice, Department of Commerce. Representatives were also present from the American Railway Association, American Electric Railroad Association, the War and Navy Departments, and others.

This work, which was first undertaken by the manufacturers prior to 1917, is estimated to hold a potential savings of $5,000,000 a year to manufacturers, distributors and users.

The program adopted this week will become effective January 1, 1926, on new production, and an additional six months is given for clearing of existence stocks. This week's action does not in any way involve grades or grits. These factors constitute a technical problem which is being studied by several organizations.

George E. Chormann, of the Grinding Wheel Manufacturers' Association, who presented the simplification program, announced that his association is shortly to issue a chart for the guidance of consumers, which will show comparable grades of various manufacturers, and permit better selection according to needs.

Willys-Knight Cab on Four Chassis Announced

TOLEDO, Sept. 28—Willys-Overland, Inc., has brought out a new line of taxicabs on the Willys-Knight four-cylinder chassis. The new line consists of three-door limousine, four-door limousine and three-door landaulet, each listing at $2250.

The new bodies are lower and more strongly braced and the steel shutters formerly used at the rear of the sides have been replaced with windows. The body interiors have been enlarged and seat six passengers in comfort. The fenders are 12-gauge sheet steel and the running boards are heavier. In addition, the brakes have been enlarged and the steering gear ratio increased from 9 to 1 to 11½ to 1.

Regular equipment includes nickeled radiator bar cap, front bumper, headlamps, bullet cowl lights, pillar lamps and monogrammed spotlight, as well as snubbers, 32 x 4½ in. cord tires, disk wheels and gasoline gauge on dash. Sixply, 33 x 5.77 in. balloons may be had at an additional cost of $20.

FOX OCCUPIES BUILDING

PHILADELPHIA, Sept. 30—The Fox Automotive Products Corp., Philadelphia, has just moved into its new building at 18th St. and Widener Ave. It occupies a ground space of 90 by 162 ft., and is four stories in height. Modern brick and glass construction has been followed throughout. There is a private siding on the Reading Railroad.

STUDEBAKER SEEKS LABOR

SOUTH BEND, Sept. 30—The Studebaker Corporation of America has been using the want ad columns of Milwaukee, Wis., newspapers in an effort to secure workmen for the South Bend plant. Drop forgers experienced in the forging of automobile parts on 3,000 and 4,000 lb. Erie and Chambersberg Steam Hammers were in principal demand.

Entry List Large for 1925 Air Races

Nearly 200 Will Compete in Finest Flying Exhibition Seen in Years

NEW YORK, Oct. 1—With nearly 200 entries received for the ten events scheduled, the 1925 Air Races, which will be held at Mitchel Field, October 8-10, give promise of being the finest exhibition in years of the development of modern aircraft, aircraft engines and flying in this country. The first race alone, the "On to Mitchel Field" event has brought forth an entry list of forty-five planes, embracing thirty-six different types, ranging from the well-known Curtiss JN-4's and Orioles, to the latest types of commercial transports, such as the Fokker F-VII, the Alexander Eaglerock, and several Sikorsky-built planes.

The fifth race, a contest for light commercial airplanes has brought forth twenty-five entries to date, while the sixth race, an event for low-powered planes has produced seven new types.

Pulitzer Trophy Race the Feature

The feature event, the Pulitzer trophy race, for high-speed planes, will take place on Saturday, October 19. Four planes have been entered, three by the Army, and one by the Navy. One of the Army planes and the Navy plane are the latest type of Curtiss racers, modeled on the 1923 racers, which, in that year, established a speed record of 244 miles per hour over a course of 200 kilometers at St. Louis.

The new racers, while similar in design to the 1923 models, are much faster, due chiefly to the increased power available through the development of the 619 hp. Curtiss V-1400 engine, which, while weighing 30 lbs. less than the Curtiss D-12 used in 1923, develops 119 hp. more. Other improvements include the design of a new type of wing water radiator made of bronze, which is considerably lighter than the old type, as it is only .004 to .005 inches thick, the thickness of ordinary paper. The material used in them, however, has a tensile strength of 105,000 lbs. The cockpit of the planes has also been redesigned to permit easy exit in case of emergency, parts of the fuselage being hinged, a cord releasing the flaps to permit easy exit. The windshield has also been greatly improved and air resistance has been cut down.

Preparations are being made at Mitchel Field to accommodate an estimated attendance of about 300,000.

CAROLINA AUTOMOBILE SHOW

CHARLOTTE, N. C., Sept. 30—The Charlotte Automotive Merchants' Association, in monthly meeting, voted to hold its annual Carolinas Automobile and Radio Show in February next year. The selection of the date in that month will probably be determined at the November meeting.

Pre-Dating Terms on Tires Dropped

Leading Rubber Manufacturers Approve Plan for Stabilization

AKRON, OHIO, Sept. 30—Approval by leading rubber manufacturers, at a meeting held here, of a program for eliminating all pre-dating terms on automobile tires for the remainder of 1925 is regarded as one of the most progressive steps ever taken toward stabilization of the industry.

There will be a temporary reduction in output estimated at 30 to 35 per cent, because of lack of supporting future orders, but in the long run manufacturers say production will be kept on a more even keel, assuring workers of jobs the year around.

Heretofore tire makers have started in October to solicit orders from dealers for spring requirements. Shipments have begun in November, but dealers were not required to pay until after the spring buying season had opened. This means of eliminating artificial stimulation to production it was decided to postpone shipments of spring stocks until March 1 save for exceptional cases with the industry manufacturing only enough tires for current requirements.

It is believed that lower consumption will relieve the temporary shortage and high prices of crude rubber.

Resolutions recommending the plan were adopted by the tire executive committee and the board of directors of the Rubber Association of America, Inc. Representatives of the larger companies both within and without the association expressed approval. About 66 per cent of the tire producers in the United States were represented at the meeting.

Warn Against Overstocking

If the agreement to abolish spring dating, long regarded in the industry as an evil practice, owing to its abuse, is fully carried out, and proves successful, abolishment of mileage business may be the next reform.

Distributors and dealers are being notified that they are to order tires during the remainder of 1925 sufficient only for current requirements. Those that are already overstocked are not being urged to buy more at present. Dealers in this class are being urged to make special efforts to dispose of their surplus tires as rapidly as possible, but are warned against resorting to price cutting or unfair methods in doing so.

The crude rubber market has already felt the effect of spring dating elimination. Spot rubber, which had been selling close to $1 a pound, dropped to 91 cents the day after the manufacturers made known their decision at a meeting in Akron, Sept. 23.

Brokers and rubber buyers here look for a further drop in the market, as production continues to be curtailed. Tire output was curtailed approximately 20 per cent in September, and manufacturers made a further cut of about 10 per cent Oct. 1.

Production during the last quarter of the year will, on this basis, be nearly 35 per cent under that of the past six months. This would appear to be a drastic reduction, had not the entire industry been operating at abnormal speed in the spring and summer. Earnings, of course, will be lower in the fourth quarter, but profits will still be satisfactory, on the whole, as a result of higher prices being obtained for tires.

Governors to Join Dixie Motorcade

CINCINNATI, OHIO, Sept. 29—Governors of fifteen states have been invited here for the Motorcade over Dixie Highway, which is to start about Oct. 10 and proceed from here Oct. 12 for the general gathering of highway boosters at Chatanooga, Tenn. Following this meeting the Motorcade will again be assembled and tour along the Dixie Highway through North Carolina and Georgia to Miami, Fla., the terminus of the highway.

Already acceptances have been received from the Governors of Michigan, Indiana, Ohio and Kentucky and the Governors of Tennessee, Georgia, North Carolina and Florida will in all probability join the Motorcade at Chattanooga.

J. Stacey Hill, vice-president of the Dixie Highway Association is chairman of the Kentucky-Ohio division. The occasion is the tenth anniversary of the Dixie Highway Association and the opening of the highway through Kentucky, which has been called for years the "detour state," but which has now completed a hard-surfaced road from boundry to boundry as a part of the Dixie Highway.

Moon's Larger Quarters

CLEVELAND, Sept. 30—Moon Motor Car Co. of Ohio (Wholesale) has increased its quarters by taking a suite of offices in the B. F. Keith Building, and a 1,500-ft. warehouse, which is also centrally located.

Ohio Car Situation Good

COLUMBUS, Sept. 30—Demand for new cars shows a small increase over last month in Columbus and Central Ohio territory and prospects are good for a continuation of demand during the remainder of the year.

Used car sales have increased and the supply of used cars is not as large as formerly.

In new cars the demand runs largely to those ranging from $500 to $1800 in price. But sales of cars of higher prices are more numerous than last year, showing a general revival of business. Money for the use of dealers and distributors is easy and there is a fairly good stock of cars in storage as a result.

Bus Tire Business on Mileage Basis

Manufacturers Forced to Go Back to Old System. Rubber Prices Down

AKRON, Sept. 30—Competition for bus tire business has caused many rubber manufacturers in the last few months to revert to the old system of selling tires on a mileage basis to the big bus operators, a canvass of leading manufacturers revealed today.

Several months ago most manufacturers had agreed not to solicit mileage contracts from commercial accounts of any kind. A few did not keep faith, it is understood, and now the practice is more or less general in the industry, although it is not advertised, and some concerns deny they are doing it.

Practically every rubber company executive interviewed declared that the sale of tires on mileage contracts is not good business. Tire manufacturers continue to go after the mileage contracts, however, largely because they are afraid of their competitors. The tire executive committee of the Rubber Association of America, it is understood, is considering action which will lead to definite elimination of the mileage policy.

Heavy Ford Orders

DETROIT, Sept. 30—The increase in orders for the new Fords under the Ford Weekly Purchase Plan, was first noticed the last ten days in August, during which the announcement of the cars was made. In that period, enrollments under the plan reached a total of 13,167, and, in the first ten days in September, the number of new purchasers under the plan totaled 16,054. Those enrolled under the plan at the time the improved cars were announced all benefited by the change, for they will receive the new types and will be given preference when they desire delivery of cars. More than 175,000 are now enrolled under the plan, and, with others coming in at the rate of 1,600 a day, it will not be long before the enrollment list will exceed 200,000.

Those who are ordering cars under the plan at present for the most part contemplate delivery either during the coming holiday season or for early spring next year.

McQuay-Norris Shows Gain

ST. LOUIS, Sept. 30—The McQuay-Norris Manufacturing Co. reports that business so far this year has shown an increase over the corresponding period of 1924, with the exception of February, which was a few hundred dollars below the same month of last year. The increase has been distributed well, with the piston and pin plant at Connersville, Ind.; the piston ring plant at St. Louis, and the bearing plant at Indianapolis all sharing.

Coming Events

SHOWS

Oct. 5-9—Atlantic City, Young's Million Dollar Pier, Manufacturers' Exhibition in connection with American Electric Railway Association Convention.

Oct. 8-17 — London, Olympia passenger car show.

Oct. 18-31 — Salonica, Greece, First International Sample Fair.

Oct. 29-Nov. 7—London, annual truck show.

Nov. 5-21 — New York, Automobile Salon.

Nov. 26 - Dec. 6 — Berlin, Germany, Annual Automobile Show in the Kaiserdamm.

Jan. 9-16—New York, N.A.C.C. National Annual Show, Grand Central Palace.

Jan. 16-23—Cincinnati, 16th Annual Auto Show, Cincinnati Automobile Dealers Association. Harry T. Gardner, Manager.

Jan. 30-Feb. 6 — Chicago N.A.C.C. National Annual Show, Coliseum.

Feb. 15 - 20 — Louisville, Ky., Louisville Automobile Show, Armory, under the auspices of the Louisville Automobile Dealers Association, J. Garland Lea, manager.

CONVENTIONS

Oct. 5-9—Atlantic City, Young's Million Dollar Pier, American Electric Railway Association.

Oct. 7-10—Montreal, Motor and Accessory Manufacturers Association Convention.

Oct. 20-21 — Greensboro, N. C. Annual Convention, N. C. Automotive Service Association.

Oct. 21-23—Boston, Fall Meeting, American Welding Society.

Nov. 5-7—Chicago, National Standard Parts Association.

Nov. 9-14—Chicago, Automotive Equipment Association.

Nov. 9-10—Chicago, Hotel La Salle, National Automobile Chamber of Commerce.

Nov. 10-11—Washington, Motor Truck Industries, Inc.

Nov. 17-19—St. Louis, National Tire Dealers Association.

RACES

Oct. 8-10 — New York, Pulitzer Cup Races.

Oct. 10—Baltimore - Washington Speedway, Laurel, Md.

Oct. 11—Charlotte, N. C.

Oct. 12—Salem, N. H.

Nov. 26—Los Angeles.

S.A.E. MEETINGS

National

Oct. 7—New York, Aeronautical Meeting (Pulitzer Races).

Nov. 9-10—Chicago, Hotel La Salle.

Nov. 12-13—Philadelphia, Automotive Transportation meeting.

Nov.—Service Engineering meeting.

Commercial Planes on 1900-Mile Tour

Seventeen Ships, Including Two Foreign, Compete in Reliability Test

DETROIT, Sept. 28—Seventeen commercial aeroplanes of the latest designs, ranging from small 90 h.p. two-passenger ships to three-engined 600 h.p. ten-passenger cabin monoplanes left the Ford Airport at Dearborn this morning on the first leg of the nineteen hundred mile tour.

Because of the entry of two foreign competitors, a ten-passenger Fokker and a six-place Junkers, both being thick-wing monoplanes, unusual interest was centered on the reliability tour.

The course the planes follow, the number of the legs and the dates of departure are as follows: Sept. 28, leg one, Detroit to Fort Wayne; leg two, Fort Wayne to Chicago; Sept. 29, Chicago to Omaha; Sept. 30, leg four, Omaha to St. Joseph; leg five, St. Joseph to Kansas City; Oct. 1, leg six, Kansas City to St. Louis; Oct. 2, leg seven, St. Louis to Indianapolis; leg eight, Indianapolis to Columbus; Oct. 3, leg nine, Columbus to Cleveland; leg ten, Cleveland to Detroit.

All planes must be capable of at least eighty miles per hour and must carry a pay-load in addition to the pilot, a half pound per cubic inch of engine displacement. A representative of AUTOMOTIVE INDUSTRIES is acting as one of the Judges of the tour and the complete tour as well as photographs will appear in next week's issue.

CHRYSLER OFFICIALS VISIT EUROPE

NEW YORK, Sept. 28—Walter P. Chrysler, president, Chrysler Corp., sailed Saturday for France and, before return ing to America will visit Saint-Didier in Paris, distributors of Chrysler cars in France, and the Nineteenth International Motor Exhibition, organized by the Society of Motor Manufacturers and Traders, Ltd., in connection with the Royal Automobile Club, at Olympia, in London.

J. E. Fields, vice-president in charge of sales, and Fred M. Zeder, vice-president in charge of engineering, sailed September 23 and will return with Mr. Chrysler.

"The motor car knows no national boundry lines," said Mr. Chrysler before sailing. "The llama in Peru, the donkey in Columbia, the pony in Iceland, the ox in Scandinavia, the coolie in China, the jinricksha in Japan, the camel in Egypt, the elephant in India—are all gradually replaced by the motor car. The world is the market of the motor car manufacturer."

Brown Instrument Co. Opens Los Angeles Office

LOS ANGELES, CAL., Sept. 30—Brown Instrument Co., of Philadelphia, announce opening of a Los Angeles branch at 363 New High St., with S. F. Godfrey, late of the Braun Corp., as District Manager. Articles of incorporation having been filed in California, this branch will carry stock and conduct its own accounting direct with buyers of Brown pyrometers, recording thermometers, Electric C02 Meters, Electric SO2 Meters, pressure gauges, tachometers and draft gauges.

Stutz Anniversary Dinner

CHICAGO, Sept. 26—The Stutz Chicago Factory Branch, Inc., celebrated its first anniversary recently by a dinner to the members of the Chicago organization at the Metropole Hotel. The guest of honor and principal speaker was F. E. Moskovics, president of the Stutz Motor Car Co. of America, Inc., Indianapolis, Ind.

The toastmaster, F. D. Cerf, president of the Stutz Chicago branch, stated that the year just past had been the most successful in the history of Stutz in Chicago, and that the branch operations had shown a profit.

Closed-Car Sales Show Steady Gain

General Motors Figures Give 63% for August, Against 40% in August, 1924

NEW YORK, Sept. 28.—General Motors Corp. reports that in August 63 per cent of all Chevrolet, Oldsmobile, Oakland, Buick and Cadillac cars sold were closed models, compared with 40 per cent in August, 1924, 30 in August, 1923, and 31 in August, 1922.

As these lines of cars cover practically all price classes, General Motors regards these figures as showing the trend of the industry toward closed cars. The percentage of closed car sales increased from 28 in 1922 to 37 in 1923 and 43 in 1924. The increase in the monthly percentages so far in 1925, over the same months in 1924 is shown as follows:

	1925	1924
January	42	34
February	54	33
March	60	38
April	61	42
May	59	41
June	58	37
July	54	37
August	63	40

Champion Tire Changer Sails

NEW YORK, Sept. 30—J. A. Kennedy, known as the champion tire changer of the world, and a brother of James Kennedy, president of the Pacific Rim Tool Co., of Cleveland, sailed Saturday on the "Veendam" for contests at the Olympia Show in London and for visits in Holland, Sweden and other points on the continent.

Willys-Overland Canadian Gain

TOLEDO, Sept. 30—Big gains in Canadian business are reported by Willys-Overland Co. Before the end of July retail sales in Canada surpassed the sales figures for the entire year 1924 by 36 per cent.

AUTOMOTIVE INDUSTRIES

VOLUME 53 *Philadelphia, Thursday, October 8, 1925* NUMBER 15

Automotive Installment Paper—

Has the Limit of Safety Been Reached?

Nearly two billion of bank funds now tied up in time payment credits. Unsound financial situation created

By H. Parker Willis

THE statement made by the directors of the National Credit Men's Association, in formal session, not long ago, that "a large peak of installment credit" had been developed in the United States, has attracted a little fitful attention. It has not, however, received very much serious consideration, and there is little or no reason to suppose that the condition to which it refers will be remedied without the adoption of an entirely new point of view in influential quarters.

In the automobile trade, the subject is well worthy of special study because of the bearing it has upon the distributive or retail sales policy of the industry.

Nobody supposes that automobiles or other articles of the same general level of cost can be sold for "cash"; few persons would even suggest that an effort so to sell them ought to be made. But in the automobile distributing industry as in others, the question of how to finance the buyer on a sound, economic basis is a very urgent one, not only from the standpoint of immediate sales but also from that of the future development of the trade.

Let us glance for a moment at the actual practice of

H. Parker Willis

MR. WILLIS, the author of this article, is a widely-known economist, educator and editor. Since 1922 he has acted as consulting economist of the Federal Reserve Bank Board. He was secretary of the board from 1914 to 1918 and from 1918 to 1922 was director of its research work.

As an educator he has occupied chairs at Washington and Lee University, George Washington University and Columbia University.

He has written a number of books on financial and economic subjects and at present is editor-in-chief of the Journal of Commerce, of New York.

How Mr. Willis Thinks the Time Payment Situation Might be Improved

1. Insist that all buyers of automobiles shall make a more substantial first payment.
2. Limit, instead of extending, the maturity of the paper.
3. Refuse to sell automobiles to buyers unless a satisfactory survey of their credit standing indicates that they will be able to settle without the necessity of the dealer or the finance company repossessing the automobile.
4. Keep careful supervision of dealers, and so far as possible let the financing be done by expert concerns affiliated with the manufacturing side of the industry.
5. Discourage unduly extensive or close financing at banks, cut down lines of long credit there to the lowest possible figure, and, above all, distribute the borrowings among many banks on a basis that will enable them to have some knowledge at least of the responsibility of the makers of the paper.

the automobile industry in connection with the retail selling of cars. A buyer pays down a certain amount of cash, which may be as low as $12.50 for a Ford machine, or a much larger amount on a costly motor. He gives to the dealer a mortgage covering his car and a series of notes maturing on various dates or a single note on which payments are endorsed monthly, and perhaps running over a period as long as two years. Technically speaking, the dealer is "pretty well secured," for in addition to the note of the customer he has a claim upon a machine which, when properly insured, ought to sell for about as much as the unpaid installments.

If for some reason it becomes necessary for the buyer of the car to get rid of the machine he can do so, and with the preceeds he can settle the unpaid balances; or, occasionally, he may transfer the whole contract to a new individual, with the consent, of course, of the original seller, who holds his paper higher, or ofoheetaoishrdlushr But when this contract situation is repeated over and over many thousand times, it has an unlooked-for result. This is the saturation of the market.

It is easy enough to find a buyer to succeed the present owner of the car, as long as there are more people who want to buy automobiles than there are automobiles in existence. It is also easy enough ordinarily to sell a used car in good condition to a new buyer, and thus enable the old owner to realize enough to pay his debts.

A Different Picture

When it becomes very hard to find such a new buyer for a used car or when the possibility that a great many cars will be simultaneously thrown on the market becomes pressing, the situation is quite different. In that case, the "goodness" of the note is entirely dependent upon the other assets of the original buyer, and if those assets consist primarily in the possibility of earning a salary it is fair to say that the immediate "liquidity" of the note depends entirely upon the general employment situation.

To put this in a rather blunt way: if employment should be greatly reduced or should break down, due to panic or business depression such as has occasionally developed in recent years, a great deal of this installment paper would be difficult of collection.

Of course, such a condition would be undesirable, to say the least, but it might not be particularly disastrous if the installment paper was held by dealers who had financed themselves through issues of their own stock, or through loans obtained from long term investors. In such a case the dealers might be more or less embarrassed; and if they had been financed by the manufacturing companies the embarrassment might spread to the latter.

Burden Transferred to Banks

The present situation, however, is not that, because the great burden of such loans has been transferred largely to the banks. Last year the production of passenger cars was 3,145,000; this year for eight months it has been 2,418,000 or at the rate of 3,627,000 for 1925. It is estimated that at the present time there is in existence about $3,000,000,000 of installment paper outstanding and a good many persons estimate that anywhere from one-half to two-thirds of this represents sales of automobiles which have been financed at banks. The paper has been put into bankable form by finance companies or acceptance concerns which have in some cases placed the notes of the buyers with a trust company as security and have then given their own notes to banks under a line of credit; or, more simply, have merely attached their customers' notes to their own notes, discounting the latter at the banks.

Acceptance companies have, in most cases, followed more or less complex plans whereby they in effect, guarantee the credit of dealers by accepting their paper, retaining for themselves a lien on the automobiles. In some cases the notes or acceptances thus put out have been guaranteed by surety companies or otherwise. What has not been done about them in this latter way does not very much matter. The point is that in a good many small banks anywhere from 5 to 10 or even 20 per cent of their holdings of "purchased paper" is in this form.

While it is very desirable for a bank to have all the guarantees it can get, in order to protect itself against

bad paper in individual cases, not very much argument is required to show that no such guarantees would be worth much in the event of a general softening of the underlying credit basis.

In such a case as has been discussed above, the banks would simply not be able to collect on these notes. They would have to renew their lines of credit and carry along the immense outstanding indebtedness until such time as the situation worked itself out. Such a condition would probably be accompanied by large failures of credit companies, for their capitals are spread out so thinly that they could not be expected to be of much service in case of a general breakdown of buying power due to widespread unemployment or some similar condition. Of course, this method of finance is chiefly used by dealers, not by automobile manufacturing concerns, but the latter would suffer indirectly and quite as severely as the dealers.

There is a very wide difference of opinion among banking authorities as regards this matter. A good many of them who have "gone into" automobile paper have had good results, and like the business on account of its profitableness. They get 6 per cent or more and frequently a "service charge" of 3 per cent or even higher, for the work they do in collecting notes. A good many of them have not footed up the actual costs of their labor in collection, and they think themselves as really getting 9 per cent on the business because, of course, in the balance of their portfolio they have to stand the costs of collection out of their own expense account. So they become more and more reconciled to the presence of this paper. Reserve banks have from time to time been doubtful about it. At one time the Federal Reserve Board attempted to make automobile paper ineligible at reserve banks, but considerations of expediency soon led to a revocation of the order.

Some Installment Paper Held

At present, it is probable that some part of the acceptance paper held by reserve banks represents installment dealings of one kind or another, although just how much it would be impossible to say. A much larger holding probably represents paper that has been discounted with the endorsement of a member bank for the purpose of financing purchases of automobiles. The Board itself had ruled at one time that paper given for the purchase of farm tractors is "agricultural paper" (that is to say business paper) and hence is eligible under the special favorable conditions established for such farm accommodation. But there has been a growing amount of uneasiness among bank examiners because of the steady invasion of bank portfolios by obligations of this sort, and especially because of the uncritical way in which a number of the smaller bankers have been inclined to admit such paper to discount. Some examiners say that an undue amount of automobile paper has been found in numerous cases of the failed banks of the West. If it has, it is only an incident, for the bulk of the installment paper of the kind discussed in the present article is doubtless in the larger banks in the cities.

What is certain is that thoughtful minds regard the present financial situation of installment paper as unsound.

Nobody supposes that the automobile selling industry wants to resort consciously to an unsound system of finance, or to allow itself to become involved with unliquid loans which under given conditions it could not collect from customers and hence could not pay to banks that have advanced the money. The present state of affairs has grown up without very much thought, largely as the result of opportunity and circumstance.

Establishing Safer Conditions

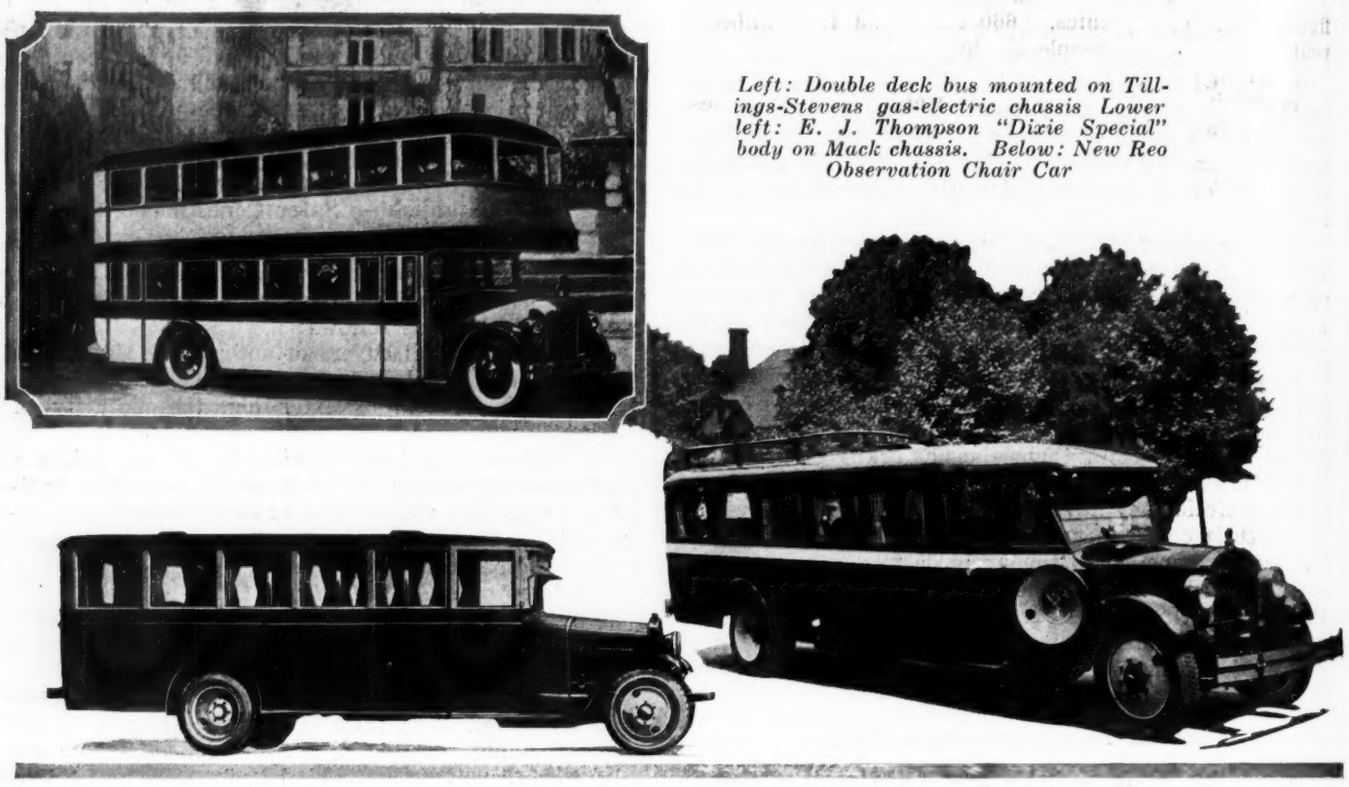
But the industry ought to consider with no little care what can be done to establish safer conditions. Perhaps the various major steps that might be taken may be enumerated about as follows:

1. Insist that all buyers of automobiles shall make a more substantial first payment.
2. Limit, instead of extending, the maturity of the paper.
3. Refuse to sell automobiles to buyers, unless a satisfactory survey of their credit standing indicates that they will be able to settle without the necessity of the dealer's or finance company's "repossessing" the automobile.
4. Keep careful supervision of dealers, and so far as possible let the financing be done by expert concerns affiliated with the manufacturing side of the industry.
5. Discourage unduly extensive or close financing at banks, cut down lines of long credit there to the lowest figure possible, and, above all, distribute the borrowings among many banks on a basis which will enable them to have some knowledge at least of the responsibility of the makers of the paper.

The banker himself should be enjoined by the examiners and authorities, if he does not recognize the necessity of such a course himself, to limit his takings of automobile paper very strictly, particularly where he knows nothing about the signers of the notes or their responsibility.

All this will result within a very short time in greatly improving the credit situation in the automotive industry and may easily have the effect of preventing a breakdown that might otherwise be incurred when least expected. It is a precautionary step, designed to insure the steady profitable progress of the distributive end of the business and thus to safeguard the manufacturing end against shock or loss due to the embarrassment of dealers or financing companies.

Bus Operation by Street Railways Doubled Since 1924



Left: Double deck bus mounted on Tillings-Stevens gas-electric chassis Lower left: E. J. Thompson "Dixie Special" body on Mack chassis. Below: New Reo Observation Chair Car

By K. W. Stillman

THE growing importance of buses in urban and interurban transportation is evidenced by the amount of attention given to this subject at the 44th annual convention of the American Electric Railway Association at Atlantic City this week. About half the space of the show being held in connection with the convention is devoted to bus chassis, bodies and accessories. The main session Monday afternoon was a discussion of motor bus operation and many other sessions throughout the week are given over wholly or in part to "transportation on rubber."

The meeting is very successful both from an attendance standpoint and from the amount of interest being displayed in the many interesting exhibits. Nearly 3000 registered on Monday, the opening day, and attendance of well over 7000 is predicted before the end of the week.

The keynote of the convention in so far as bus operation is concerned was expressed by J. A. Queeny, vice president, Mitten Management, Inc., when he said that traction companies must eventually provide facilities to care for every transportation need of the communities which they serve. This includes not only rail transportation and bus service, but taxi operation must also be provided if a company is to fulfill its purpose as the community's transportation agent.

The belief was expressed that the proper field for bus operation was in competition with privately owned cars which have made the greatest inroads on the operating revenues of traction lines. The public has become accustomed to the comfortable, rapid and convenient transportation provided by a private car and buses offer the only possibility for regaining the private car trade. On this account the very distinct trend of bus body builders, as evidenced by the models displayed at the show, toward more luxury and comfort than ever before, indicates that bus builders have been making a rather close study of the market and have anticipated, to a large extent, the future demand by traction companies for buses which can compete favorably with private cars in comfort and convenience.

The need is still present, however, for so-called street car type buses to operate in connection with rail lines and especially for use on more congested routes. The most interesting development along this line during the past year is, probably, the gas-electric eight-wheel bus built by the Versare Corp. This is equipped with a street car type body providing seats for 44 and standing room for 52 more giving it a total capacity of 96 passengers, or as great as many urban street cars.

During the discussion of the report of the Commitee on Bus Transportation the experiences of a number of traction companies with buses were given. In no case had a company taken up bus operation and found it unsatisfactory. In many instances buses had built up an otherwise unprofitable route to a point where it was of real revenue producing value.

The extent to which buses are being operated by electric traction lines has grown remarkably during the past year.

249 companies now using nearly 4500 buses. Speakers at A.E.R.A. convention suggest that trolley systems also go into taxicab business and construct their own highways

Today 249 companies operate nearly 4,500 buses over 11,670 miles of route, which can be compared with last year's figures of 171 companies, 2,660 buses and 4,285 miles of route. The traction people are by far the largest consolidated group of bus users.

Several interesting suggestions were made at the session Monday afternoon, possibly the most interesting being that of R. B. Hill, Los Angeles Railway, that traction companies may find it necessary, and profitable, if highway congestion increases, to construct private highways over which to operate their inter-urban bus lines and which might also be opened to limited private car use as toll roads.

Mention was made of the necessity for providing more comfort and less arduous work for bus drivers, the idea being, apparently, that use of power brakes and elimination of or decreasing the labor of gear shifting was as important as the position and construction of drivers seats.

The show is primarily a show of de luxe parlor car type coaches. They predominate in numbers and in the amount of improvements made. Chassis changes were very few. The only new jobs were the Tillings-Stevens gas-electric and the American-La France and, of course, the former has been in use in Europe in slightly altered form for several years. Several chassis manufacturers had made minor improvements but nothing really new has been developed in the bus field recently.

Bodies Are Improved

New bus engines were also noticeable mainly for their absence. The only one which has not already been described for the readers of this magazine was a new Buda light six-cylinder design for taxicab and light bus work.

In body design there was evidence of a great deal of work on the part of designers. As mentioned before, most of this work has been directed toward making the buses more comfortable, more convenient and more luxurious. And most of them have succeeded so that many of the coaches on display provide greater riding ease than can be had in any other form of transportation, the high class Pullman car not excepted.

Not only has much thought been given to the interiors both from the standpoint of comfort and appearance but the exteriors have been brightened up and in general made more pleasing to the eye. Two-tone effects have been used generally, sometimes in harmonizing colors and sometimes in contrasts. Greens, blues and browns have been used extensively, usually with a lighter color for trim or for the belt with which practically all jobs are decorated. Many novel effects were attained by carrying the belt line over the radiators, giving the roof a bright color in sharp contrast with the body and in like ways. The general effect was to give the rooms in which the buses were shown a very gay appearance and no doubt the effect on the riding public will be as gratifying as it is to the people who viewed the exhibits.

The Versare Corp. had its eight-wheel gas-electric bus on exhibition and it attracted considerable attention. This bus was described at some length in *Automotive Industries* for April 16, 1925, but at that time it was still in the experimental stage and the present completed job contains some changes, mostly in minor details, from the one then described.

Prime power is supplied by a Waukesha 6-cylinder 4½ by 5¾ in. engine equipped with Zenith or Stromberg carburetor, Scintilla, Eiseman, Apollo or Bosch magneto and Leech-Neville generator and starting motor. Either Westinghouse or General Electric drive consisting of generator, 2 motors, controller, braking controller and braking resistance is furnished.

Eaton front and rear axles, Sheldon springs, Budd wheels, Westinghouse air brakes, Spicer universal joints, Midland Steel Products truck frames and Alemite high pressure lubrication are all standard equipment.

Has Short Turning Radius

Total wheel base is 29 ft., with an overall length of 38 ft. In spite of this great length the bus can be turned without backing in a radius of 45 ft. This is made possible by a specially developed steering arrangement by which each pair of wheels, both front and back, are operated from the steering wheel, the rear pair following in the track made by the first pair. Movement of all wheels except the front pair is accomplished mechanically so that it is said the bus steers with little more effort than that required by one of ordinary size.

Overall width is 8 ft. and height 104 in. Interior height is 69 in. Normal speed is 25 m.p.h., although a speed of about 40 m.p.h is possible. The street car type body with which this chassis is being fitted has a seating capacity of 44 and room for 52 more standing. The bus has two doors, one in the usual position at the front and the second on the right side and about three-quarters of the way back.

The electrical equipment used and the method of operation remain practically the same as given in the article previously referred to.

A new low type chassis especially designed to meet the needs of bus transportation was shown by the American-La France Fire Engine Co. It is being built complete by the American-La France organization.

A four-cylinder, L-head type engine with removable head furnishes power and improved carburetion and minor refinements in design are said to increase considerably the power developed. The frame is of 10-in. heat-treated chrome nickel pressed steel. Body outriggers are steel castings which provide body supports of sufficient rigidity to eliminate body strain under the most severe road conditions.

New Steering Gear

The service brake is American-La France disk type, air-cooled, located on the propeller shaft back of the transmission. It is so designed that relining is an easy matter. Emergency brakes are internal expanding located on the rear wheels, and they are equipped with 18 in. diameter drums, 3½ in. wide. Westinghouse air brakes on all four wheels are optional at additional cost, in which case the emergency brake lever in the driver's compartment is connected with the transmission brake.

An entirely new design of steering gear is used. The steering column is set at an acute angle to provide maximum comfort for the driver. Spark and throttle tubes go directly through the dash and the steering gear

is located behind the motor where there is plenty of room for the assembly.

The gear is irreversible and connot transmit road shocks to the wheel because of the small lead, about 10 degrees, given to the gear screw. The 4 in. lever with which the nut engages gets far enough away from the shaft so that pressure on the screw surfaces is reduced and perfect lubrication assured.

De Luxe Coaches Featured

A ratio of 24 to 1 is provided by this arrangement and since this is much too slow for most steering gears, two bevel gears have been placed at the top of the steering gear column between the hand wheel shaft and the steering gear shaft. This produces a contracting or expanding ratio which results in an overall ratio of about 10 to 1. Specially designed taper roller bearings in the steering knuckle spindles increase the ease of steering.

Double reduction type rear axle is used, full floating with electric welded pressed steel housings. The differential is three bevel gear type. Driving reactions are absorbed by radius and torque rods. Front axle is a one-piece, drop forged I-beam of heat-treated chrome-nickel steel 3⅝ in. deep with 2½ in. flange.

Ten bolt type Budd disk wheels are provided with 34 x 7 in. pneumatic tires front, dual rear. Ground clearance is 8 in. Standard equipment includes front bumper, speedometer, electric horn, oil gage, eight-day clock, dash lamp.

This chassis is built for a 25 to 29 passenger body in wheelbases of 196 and 226 in. Turning radius for the smaller type is 33 ft. and for the larger 37 ft. 6 in.

De Luxe Parlor type coaches are featured again at the show, many manufacturers having no display of street car type bodies at all. Improved seating arrangements, especially over rear wheel housing, luggage carriers both on top of the body and in special compartments in the rear, which are usually provided with folding seats for emergency use, narrowing of body pillars with consequent widening of window spaces and some improved ventilating devices are the main features of the bodies shown.

Various methods are being tried to make seats over the wheel housing comfortable. Possibly the most unique is that used in Lang body mounted on an International Harvester chassis and also in an Acme Parlor Car. A platform about 8 inches high covers the section over the rear wheels. A single upholstered wicker chair is placed in the center of this and at each side there are longitudinal seats for three people. At the rear the remaining seats are placed on the lower level.

In a Weatherproof body mounted on a Commerce chassis, the floor is ramped back from the entrance door so that while the wheel housings are still in evidence they are by no means as obtrusive as usual. In the Observation Chair Car built by Thompson the space over the wheel housing is used for luggage.

The Six Wheel Co.'s De Luxe body uses one single seat and one double seat over each wheel housing instead of double seats on both sides as in the rest of the car. These seats are set some distance in from the outside of the car so that the housings are very little inconvenience.

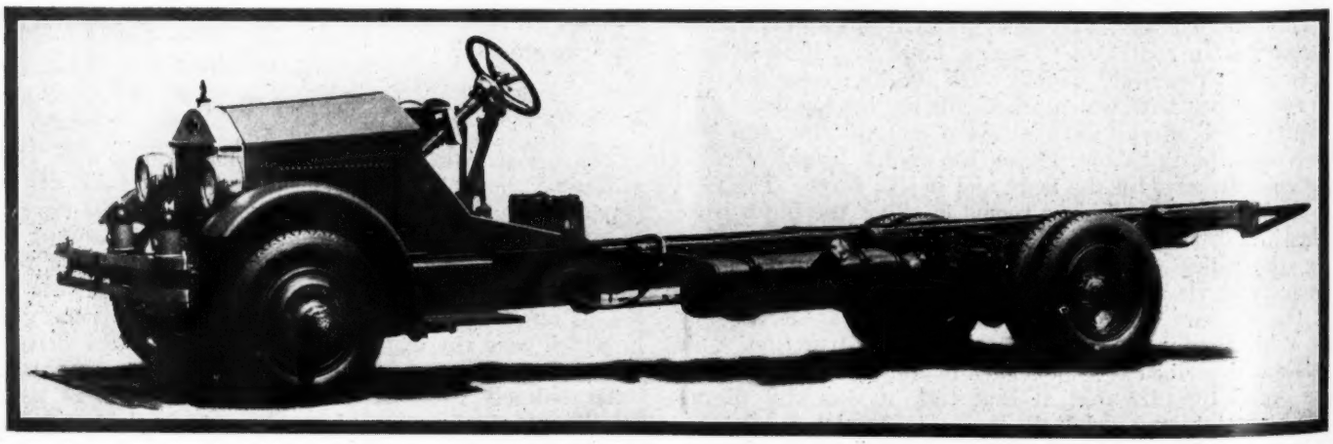
Many other makers have so arranged their seats that the housings come under one of the chairs. In the many jobs that are equipped with a separate baggage compartment at the rear the housing usually comes under the rear cross seat and so is quite out of the way.

Practically all of the parlor type bodies shown are equipped with luggage carriers on the roof, reached by a ladder at the rear, either in the center or at the right-hand side. These carriers have substantial railings around them and are evidently made for hard service. This feature makes a very strong frame necessary but the prevailing opinion seems to be that a frame strong enough to stand up under the heavy loads and severe operating conditions to which long distance buses are subjected needs little or no additional strength in order to support luggage. And, if these buses are to be complete, service provision must be made for carrying luggage on interurban runs.

Window Areas Increased

Almost as common as overhead luggage carriers are special compartments at the rear. These are intended for use in stormy weather when tarpaulins will not provide sufficient protection for luggage on the roof, and also for excess luggage. Nearly all of these compartments are equipped with folding seats of the type used in taxicabs so that they serve as emergency passenger space as well.

Nearly all body builders have been striving toward increased window space, many of them with such good results that the passenger's view is but little more restricted than in a phaeton body. Pillars have been narrowed to such an extent that doubt was sometimes expressed as to the strength of the structure, and their number has been diminished so that there are several 20 to 25-passenger chair cars which have only four windows on each side between the baggage compartment and the windshield.



Side view of new bus chassis built by American La France Fire Engine Company

Some advancements have been made in ventilating systems. All parlor cars have from three to five roof ventilators of various types while the means of letting fresh air into the coach vary considerably.

The Six Wheel de luxe body has a one-piece windshield which can be slid upwards about three inches in its supports. This opens a passage through the cowl and air is deflected downward toward the floor of the car. Both Yellow Coach de luxe type buses shown have stationary one-piece windshields with an adjustable opening across their tops for ventilating purposes.

A Farnham Nelson body on a Pierce-Arrow chassis has a one-piece windshield which swings out from the body. Directory behind the opening is a glass shield which deflects the air above and below so that the direct breeze would not strike the faces of the driver or the passengers. Probably this arrangement would also be valuable during rain in keeping spray out.

A number of other builders have placed ventilating holes at the side of the cowl. These are adjustable and although few of them appear to be of sufficient size to provide all the fresh air necessary when windows are closed they are undoubtedly much better than nothing at all.

In a Brown body mounted on a Schacht chassis the front quarter windows are adjustable for ventilating purposes. An Acme body and the Reo chair car have ventilators at the side of the cowl.

Fittings, trim and the general appearance of interiors is becoming more luxurious than ever. Wicker chairs with leather backs and cushions are used extensively. Mirrors on body pillars are almost standard equipment. Silk draw shades hung on nickeled rods are used on nearly every job. In at least two bodies solid walnut is used for the dash and all inside trim, and the Yellow Coach bodies have walnut ceilings.

More Room Between Seats

Ample room is being provided between seats so that all but a very few can sit in entire comfort. A six-foot man cannot find a single coach in which he could not sit with entire comfort. Seat springs and cushions are luxurious. The pneumatic cushions used on a Buffalo Body Co. job on Pierce-Arrow chassis among others are exceptionally soft and easy but practically every car gives all the comfort which could be desired.

Several bodies are equipped with various accessories such as ash trays and the E. J. Thompson body shown, an Observation Car, has a very complete equipment. A cord extending along the inside top on each side of the aisle is used by most builders for operating the buzzer signal in place of the conventional push buttons.

A Lang body is shown with a chemical toilet in the rear right hand corner. A number of cars have smoking compartments separated from the rest of the body by glass partitions. Nearly all windows can be lowered and many of them slide between rollers to prevent vibration.

There is very little evidence of improvements in the pay-enter or street car type of bodies in spite of the fact that the street railway men are supposed to favor these in preference to de luxe types. There are relatively few on display and these showed not many changes over the exhibits of last year. Probably about 25 per cent of all buses on display are designed for mass transportation.

One feature which, while installed on a de luxe type car, may be of use for street car types is a special National cash register. This is shown in a Brown body on a White chassis built for the Boston and Maine Transportation Co. The register is placed so that it could be easily operated by the driver and furnishes a printed receipt for fare paid as well as registering fares.

Detail rear axle and frame construction Union Motor Truck bus chassis

Unique seating arrangements have been used in a double-deck bus built by Six Wheel. In this ample head space is provided in the lower deck aisle by raising the ceiling over it about a foot. On the upper deck are 20 single seats back to back over this elevated portion of the ceiling and facing diagonally forward. Two additional seats at the front face diagonally backward. Two double seats and two odd single seats are at the rear. There is a platform slightly above the floor for the passengers' feet.

An Uppercue Coach built for the New York Transportation Co. has floor only 13½ inches above the ground.

An appeal for Federal regulation of motor buses as common carriers is the way in which the A. E. R. A. intends to counteract the effects of the recent Supreme Court decision depriving states of regulation over inter-state bus lines. Harry Reid, chairman of the Committee on National Relations said that transportation, in the best economic sense, is essentially the duty of an agency having a monopoly in its field. Any territory, to insure itself good and complete service of a permanent nature must guarantee its transportation agency against destructive competition. The only way in which service can be maintained is to rely on one agency and see that that agency, while providing service, earns something for its efforts.

The only way in which this condition can be obtained on inter-state lines is through Governmental regulation and Mr. Reid stated that the electric railway industry is vitally interested, not only in order to protect its own interests but in order to serve the interests of the public, in obtaining Federal regulation of all inter-state business. He strongly emphasized the importance of this move and advised the entire industry to get behind the movement for protection by regulation.

Buses Safer Than Trolleys

That motor buses are less prevalent sources of accident than electric cars and that, on the average, their severity is not so great was the conclusion reached by C. E. Redfern, United Electric Railways Co., Providence, R. I., in a paper giving the experience of that company with bus accidents.

During the calendar year 1924 this company operated 44 buses and ran a total of 1,123,849 miles. During this time they ran 4,147 bus miles per accident as compared with only 2,183 trolley miles per accident.

During this same period 42 per cent of the claims arising from bus operation were settled and 44 per cent of those from trolley accidents. The average cost for the buses was $42.97 and for the trolley $66.56. Trolley accidents cost 1.3 cents per mile while bus accidents cost only 0.44 cents per mile.

Mr. Redfern did not offer these figures as conclusive evidence of the relative accident provoking proclivities of the two types of transportation but thought that they might be considered indicative of what might be found as a result of more exhaustive study. He considers the psychological attitude of the American people as a strong factor in the decreased bus claims. He believes that most people look upon minor collisions or accidents as of no consequence when related to bus operation and so put forward no claims for compensation when the same degree of injury occurring in trolley operation would almost invariably bring a claim.

Training of Employees

As a means for decreasing the number of accidents he gives proper training of employees first place. Because of the more difficult operating conditions surrounding bus movement it is his belief that a bus driver needs a nicer judgment, quicker mental and physical reactions to constantly changing traffic conditions than is required of a trolley motorman.

Proper maintenance was also given as being of great importance in making operation safe and Mr. Redfern stated that one weak man in the inspection department may cost more money than the salaries of half a dozen good men. Frequent and thorough inspection, replacement and repair should be carried out without thought of saving money. Money saved in this department is usually the cause of huge losses through the claim department as well as having a very bad effect on the public's opinion of the service rendered.

Collisions of buses and trolleys take first rank in order of importance since both usually are owned by the same concern and there is no recourse. Such accidents usually occur in urban communities and while of frequent occurrence are not often serious since they are caused by congestion and neither bus nor trolley is moving rapidly.

Collisions between buses and the rear end of other vehicles are particularly serious since there is small chance for the bus operator to deny or contest liability. They are hard to prevent under present heavy traffic conditions but careful driving and close attention to the condition of brakes are important items. With the present tendency toward more effective braking systems for buses, accidents of this nature may be expected to diminish rather than to increase.

Poor Driving Blamed

He believes that most head-on collisions may be attributed to poor driving since there seems to be small necessity under ordinary conditions for a bus to be out in the road far enough to make such an accident possible. "Hogging" the road is a tendency found in bus drivers as well as in drivers of private cars and Mr. Redfern thinks that no amount of discipline can overcome it as a rule. Firing drivers who are possessed with it was given as the only effective means of coping with the situation.

The Committee on Bus Transportation, through its chairman, A. H. Ferrandou, presented the results of an investigation made of several interesting subjects pertaining to bus operation by electric railway companies.

The principal reason for establishing bus operation was to provide feeder lines for rail service. This, together with providing cross town lines connecting parallel trolley lines where traffic is not sufficient to warrant investment in trackage, appeared to be the only prevalent reasons for inaugurating bus service. In particular, bus lines have been used to serve communities which have sprung up beyond the established electric line but which would not, at present at least, provide enough traffic for profitable operation of a rail line. In a few localities buses have been adopted by railways solely to eliminate competition from jitney and independent bus lines.

Trolleys Used Where Profitable

In very few instances, apparently, have bus lines been established on routes which might be expected to support a profitable trolley line. In some cases a trolley line which did not show a profit has been replaced by bus service which, although it too may operate at a loss, is usually less unprofitable than the trolley line.

Opinion differs among the railway men whether bus lines should be expected to show a profit. Some companies, apparently, are using bus lines to build up a community to a point where profitable trolley service can be established. Others are using buses only on those line which must be operated in order to obtain a rounded out transportation system but which will not support trolley service.

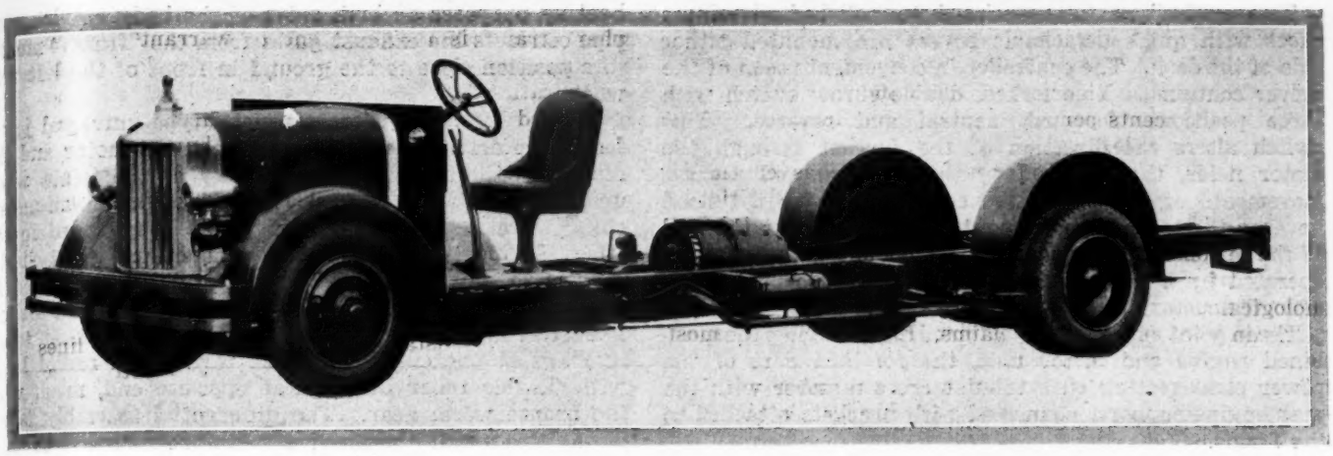
The prevailing tendency seems to be to use buses for those border line routes where the question of operating profits is a matter of some doubt and utilize trolleys for the profitable runs. Buses are undoubtedly advantageous for this work but this condition must be realized whenever an evaluation is made of their value as an urban transportation medium.

The street car type of bus was found to be satisfactory for most uses. For long interurban runs parlor car and sedan type buses are being used to a considerable extent but for urban use most companies do not feel that the public is willing to pay for the extra comfort. More attention is being given to the comfort of passengers but the additional expense of providing the luxury and convenience of parlor cars was generally thought to be unwarranted.

Unprofitable Routes Continued

In determining the views of companies toward the future of bus lines it was found that most companies consider them on the same basis as rail lines. Many bus lines are unprofitable but as a rule the companies have no intention of abandoning them. Instead they will try to make them profitable but even if this proves impossible they will be retained as feeders for more profitable lines. Other companies consider their bus lines as forerunners of future rail service and developers of territory and as such their operation, even at a loss, will be continued. Where bus lines are operated as an independent line it was thought that they should prove remunerative or be abandoned.

Opinion was divided over the use of de luxe type buses. Some companies believed there was a field for this type in urban transportation but the majority believed it should be confined to long interurban runs and simpler types of vehicles used for short lines. Opinions differed likewise as to whether bus lines should be made to show an operating profit. Some companies contended that buses took the place of rail lines which in many cases were unprofitable, so that they should not be expected to operate without loss. A lesser number believed that all bus lines should be profitable. Of course everybody wanted their lines to show a profit and every effort is bent toward that goal but the prevailing opinion was that because of the nature of the service for which buses were being used the fact that profitable operation was impossible should be no excuse for abandoning the line.



Tillings-Stevens chassis showing motor, dual wheels and welded steel integral wheel housings

Tillings-Stevens Gas-Electric Bus Introduced in America

Four chassis with English electric units and mechanical parts of U. S. make are shown at Atlantic City. Waukesha engine used. Single and double-deck bodies

TILLINGS-STEVENS gas-electric buses, several thousand of which have been placed in operation in England and on the continent during the last 12 years, are being introduced in America by the American National Omnibus Corp., which is displaying at the American Electric Railway Association show at Atlantic City this week four chassis built by the Gray Manufacturing Co.

This type of bus is an electric transmission system in which all the power of the gasoline engine is at all times converted into electric power and as such is transmitted to an electric motor which converts it back to electric power, but at a different relation between torque and speed. A complete description of the system used was given in *Automotive Industries* for March 19, 1925.

For American use the bus will have a number of standard American fittings and accessories. In operating principle it is similar to the General Electric-Yellow Coach bus described in *Automotive Industries* for March 5, 1925. The main point of difference between these two types is that the Tillings-Stevens employs a single motor with an offset rear axle of conventional design while the other type utilizes a motor for each of the two drive wheels, eliminating the differential.

4-Cylinder L-Head Engine

A Waukesha four- or six-cylinder high compression bus engine of the detachable L head type, with Ricardo combustion chamber, will be used to furnish primary power. Zenith 1½-in. double venturi carburetors, Robert Bosch high tension magnetos and Leece-Neville generator and starter units are used. Either 300 or 600 watt, 12-volt generators are supplied for single and double-deck bus service, respectively. The 12-volt starter engages with the ring gear on the fly-wheel by Bendix drive. Westinghouse air compressor, with which brakes are operated, is driven from the camshaft and is located on the left side of the engine.

Electric Motor on Left Side

Between the two center tubular transverse braces of the chassis, a heavy longitudinal member is placed which is clamped slightly off the center line of the chassis to the two cross braces. The electric motor is located in the space formed on the left-hand side by the center member, the cross braces and the chassis side rail. On the right side, the corresponding space is employed to carry the gasoline tank, which in this position sets flush with the top of the chassis frame.

The motor, which actually propels the vehicle, is an exact duplicate of the generator, having the same degree of accessibility, while approximately 90 per cent of the parts are interchangeable. This was one of the special features worked out to reduce costs of maintenance and facilitate servicing on the new buses. The electrical units are English built.

Mounting the motor in this offset position under the seats allows a clear aisle space down the center of the bus, a low floor height, and also permits a straight line drive to the axle. The worm and differential section of the rear axle is offset to correspond with the motor. In addition, this longitudinal member makes re-inforcing of the floor possible, the use of lighter construction and assists in eliminating floor vibration.

Two controllers fully enclosed in polished aluminum cases with quick detachable covers are mounted either side of the dash. The controller in convenient reach of the driver contains a Yale locked, double throw switch with three positions, forward, neutral and reverse. This switch alters the direction of the current through the motor fields, thus controlling the forward and reverse movements of the bus. The controller under the hood governs the torque requirements of the motor at the will of the operator to suit the varying road conditions. It is operated by a single lever on the steering wheel much after the customary spark advance lever.

Three point suspension is adopted for carrying the combined engine and motor unit, the forward part of the power plant resting on a tubular cross member with the rear engine supports connected with brackets attached to the frame.

Gas Tank Has Patented Feature

Vacuum feed is employed to draw fuel from the heavy welded steel gasoline tank located in the middle of the chassis. A patented feature of the tank is the method to catch the overflow and the drip from the filling nozzle. A reserve tank of four gallons capacity and a hand hole cover on the bottom side to permit clearing the interior are additional features of the tank.

Vertical shutters, provided with a locked adjustment, are fitted in the front of the V-shaped one-piece polished aluminum radiator shell. The core itself is of the vertical finned flat tube type. The entire assembly is insulated from shocks and vibration by rubber blocks and can be readily removed from the chassis in a few minutes. Radiator filling has been simplified by a patented quick acting hinged cap, which is locked and unlocked by a single motion of the cap emblem.

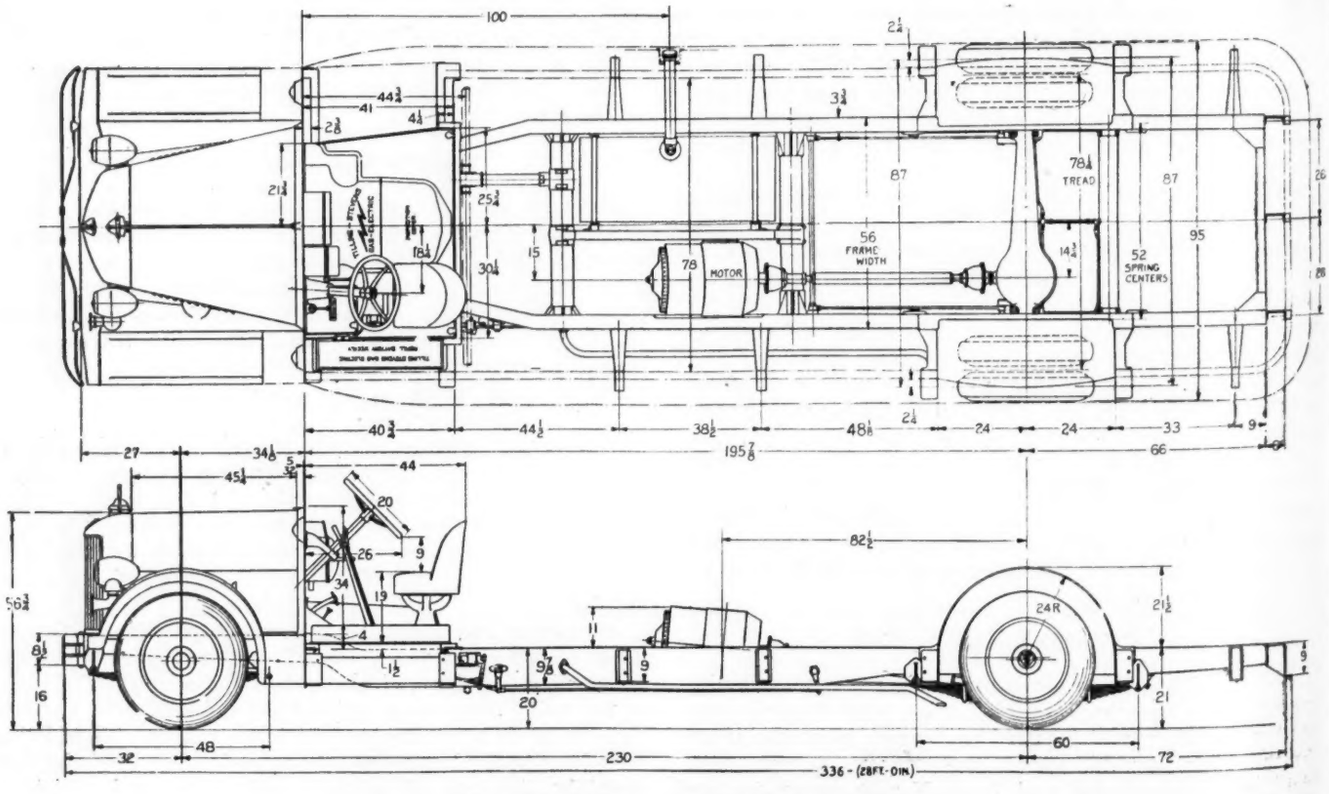
Between the engine and the second tubular 6-in. cross member, which acts as an effective muffller, a Petry double outlet valve allows equal distribution of the gases for heating purposes on both sides of the body. A long tail pipe conducts the exhaust gases from the "frame" muffler to a position close to the ground in front of the left rear wheel.

A propeller shaft with two metal type universal joints forms the driving connection between the motor and the rear axle, there being no angularity at the joints when under full load. Specially developed by Timken, an underslung worm and wheel type of drive is employed in the offset ¾ floating rear axle. Underslung semi-elliptic springs of the two stage progressive type, mounted in shock insulating rubber blocks, take both drive and torque. The steel worm, mounted on opposed adjustable taper bearings at one end to take the thrust and radial loads with flexible roller bearings at opposite end, mesh with the bronze worm gear. The differential assembly is removable as a unit and provided with proper ratios to meet sundry operating conditions. A Timken front axle of the center-point steering bus type, with dropped beam and king pins mounted on taper roller bearings, is adopted.

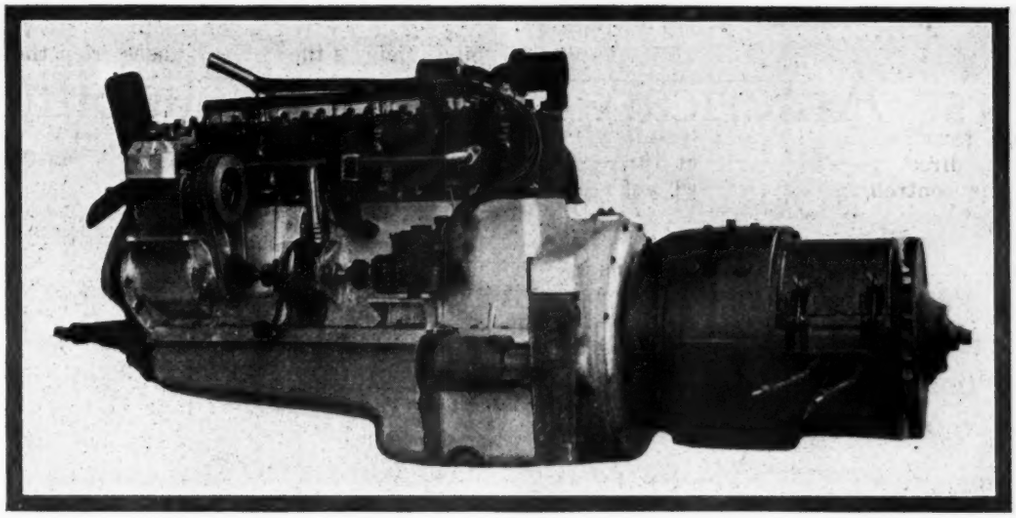
Westinghouse Air Brakes

Westinghouse automotive air brake system, operating self-equalized internal expanding brake shoes on all four wheels, is employed as standard equipment. The emergency brake is operated by a long pull-type lever acting on internal shoes in the rear wheels. Armored flexible leads from the air reservoir to the separate pistons inside each air brake drum causes the cast iron brake shoes to act directly against each drum. These pins, which are anchor mounted, are supported on both sides preventing distortion and rattles and allowing even bearing surface of brake lining. Pistons have sufficient travel to wear out the complete thickness of brake lining so that adjustment is not necessary throughout the life of the lining.

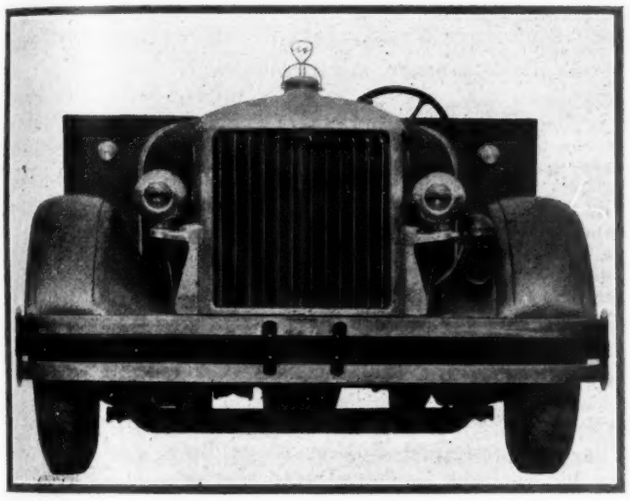
Ross cam and lever type of steering gear to Tillings-Stevens specifications is rigidly mounted on a frame bracket and is provided with additional rubber block sup-



Plan and elevation of Tillings-Stevens bus

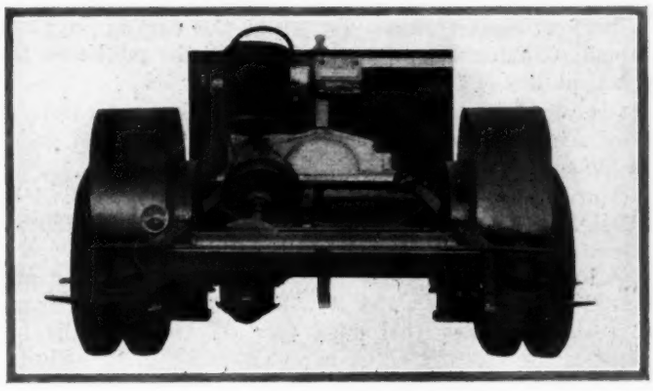


Above: Combined gasoline engine and electric generator. Air compressor is shown at forward end of engine



Front view, showing width of all steel dash, radiator shutters and integral housings

Below: Rear view of chassis. Note offset electric motor



port near the steering wheel hub to eliminate vibration. A long straight one-piece tubular drag link mounted on ball and socket joints is employed, which in connection with the gear allows a 43 deg. movement of the front wheels. Standard hubs allow changes to pneumatic, solid or cushion tires in a few minutes. Budd-Michelin pressed steel tapered disk wheels are regularly provided for pneumatic tires all around, with dual wheels on rear. Budd wheels of the same design are also available for cushion tire equipment. Either pneumatics or cushion tires of 34 in. by 6 in. or 34 in. by 7 in. size are supplied as standard equipment.

Rigid Mounting for Spring Bumpers

Pressed steel side rails of ¼ in. stock and of 10 in. maximum depth are connected together by three 6 in. dia. tubular cross members, a smaller diameter tubular brace near the front of the frame and two gussetted pressed steel members at either end. The last mentioned are arranged so as to provide rigid mounting for spring bumpers while all the tubular members are brazed into steel castings riveted to the side rails. Over the rear axle there is an 18 in. kick-up, which is arranged by riveting a pressed steel section to the side rails. In production this kick-up will be formed in the pressing of the side rails.

Rear wheel housings are formed integral with the kick-up and are made of ⅛ in. sheet steel with welded joints. This type of construction is a patented feature which besides being independent of the body forms a support for it. Entire chassis is coated with sprayed baked enamel. The front fenders are wide and fully crowned and are rigidly attached to the frame and front cross bumper channel. A sheet steel dash mounted just back of the engine and extending to the corner posts on the body allows rigid fastening for the body, steering column, instruments, controllers and engine hood.

As sold, the chassis is complete in itself for road operation. Included in the standard equipment are: Adjustable driver's seat, cast aluminum front floor, nickel-plated front and rear spring bumpers, Robert Bosch two-tone horn, Edmonds and Jones 21 c. p. headlights, two cowl lamps similar in appearance to the main lamps, a combination tail and stop light, tools, oiler and jack.

Three Body Types Shown

Only three of the chassis exhibited at Atlantic City were fitted with bodies. One had a two-deck bus carrying 64 passengers, another a single-deck model with room for 29 people and the third a touring coach holding from 22 to 27 persons. In production, bodies will be built to purchaser's specifications.

First American Airplane Reliability Tour a Distinct Success

Practicability of air travel is strikingly demonstrated by 1900-mile jaunt. Fifteen out of 17 machines finish, 11 of them with perfect scores. All will get names on Ford cup.

By Leslie S. Gillette

BEARING in mind the exceptionally bad weather conditions and the gruelling test of a 1900-mile flight, the First Annual Commercial Airplane Reliability Tour has demonstrated to a skeptical world that modern commercial planes under normal conditions are as reliable as any other mode of transportation. Reliability was the factor demonstrated by the tour—the first of its kind ever to be held in America—just as in the earlier days the famous Glidden Tours served to "sell" the public on the practicability of the automobile.

Out of 17 planes which started, 15 returned safely at Ford Airport, Dearborn, Mich., where the contest ended on Sunday, October 3.

Contrary to expectations, the $7,000 trophy offered by Edsel Ford was not awarded to any individual manufacturer. Instead, all planes which in the final tally were found to have made perfect scores will have their names placed on the trophy and it will be held for next year's contest. Although the rules for 1926 will not be announced for some time yet, it is expected that the original plan will be carried out and that the individual manufacturer whose plane makes the best all-around performance will be awarded possession of the prize until the third tour is conducted in 1927.

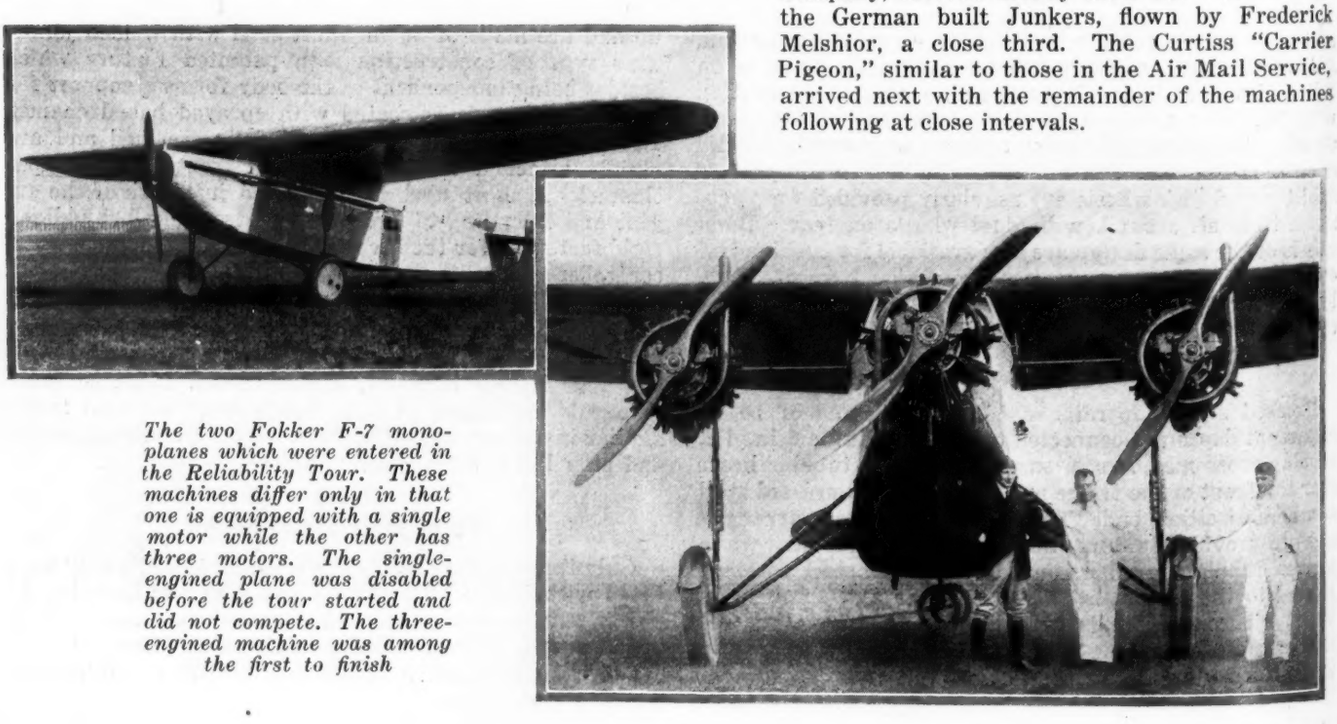
The planes which won places on the trophy this year, with the flying average, are as follows:

Plane	Pilot	Flying Time	Flying Average
Ford No. 30	Edward Hamilton	17.53 hrs.	100.5 m.p.h.
Yackey Sport No. 36	Walter J. Adams	20.97 "	85 "
Martin Commercial	L. B. Richardson	20.42 "	85 "
Martin Commercial No. 24	Cy Caldwell	21.21 "	83.7 "
Curtiss "Carrier Pigeon"	Casey Jones	18.18 "	98.4 "
Fokker No. 20	E. P. Lott	18.04 "	98.5 "
Laird Swallow	Carl Rowland	22.78 "	78 "
Waco No. 19	Lloyd Yost	23.31 "	75.2 "
Travel Air No. 4	Walter Beach	19.94 "	89 "
Travel Air No. 0	A. K. Campbell	24.16 "	73.6 "

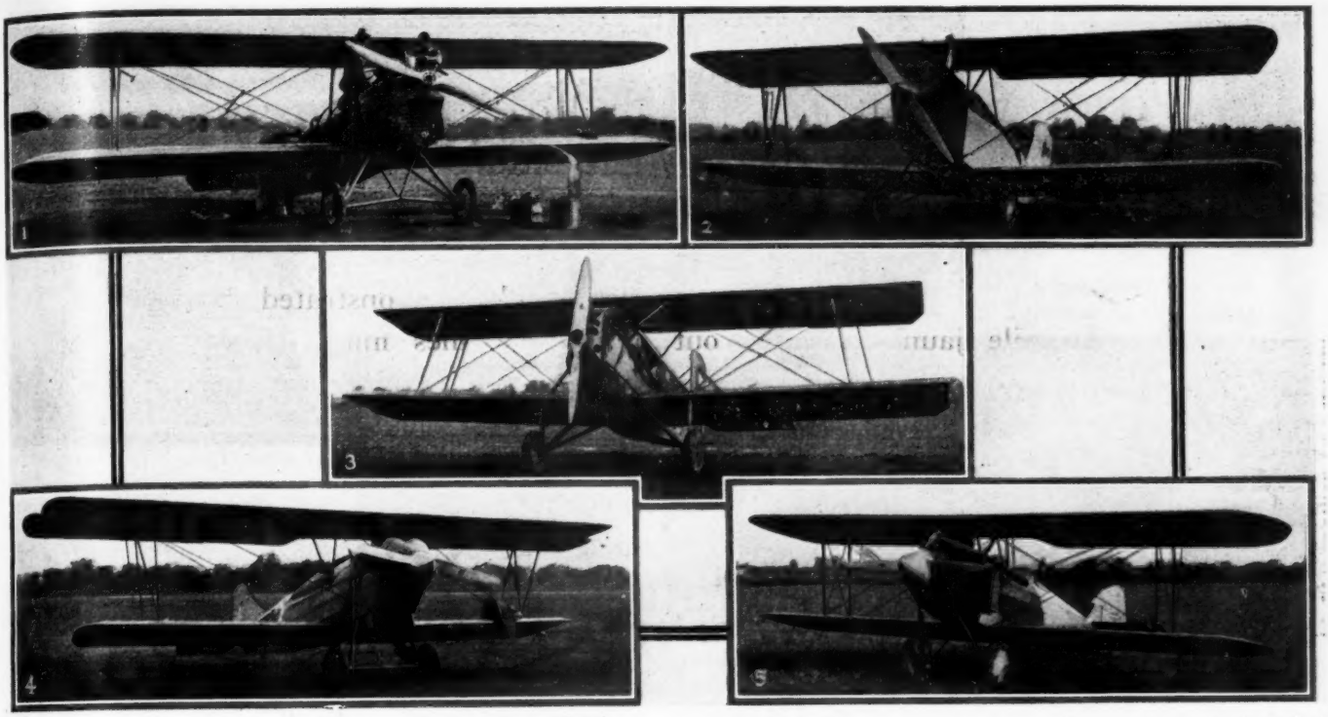
Travel Air No. 2 (check incomplete)

The three engined Fokker monoplane, designed and flown by Anthony Fokker, Dutch airplane manufacturer, was the first to finish the 1900 mile flight.

"Maiden Dearborn V" (Stout metal monoplane), piloted by Edward G. Hamilton, the sole entry of the Ford Motor Company, arrived shortly after the Fokker, with the German built Junkers, flown by Frederick Melshior, a close third. The Curtiss "Carrier Pigeon," similar to those in the Air Mail Service, arrived next with the remainder of the machines following at close intervals.



The two Fokker F-7 monoplanes which were entered in the Reliability Tour. These machines differ only in that one is equipped with a single motor while the other has three motors. The single-engined plane was disabled before the tour started and did not compete. The three-engined machine was among the first to finish



Some of the leading contenders for honors in the Reliability Tour are shown above. 1—The Glenn Martin. 2—Mercury Junior. 3—Curtiss "Carrier Pigeon." 4—The "Travel Air." 5—Laird Swallow

While several large organizations, including the S.A.E., The National Aeronautic Association, the Detroit Aviation Society and the Detroit Board of Commerce, were active in the management of the event, the leading part was played by the Ford Motor Co., which, besides providing the trophy and cash prizes, awarded to all competing the tour and a starting place for the planes, arranged an exposition of aircraft accessories, engines and planes in which over 70 manufacturers exhibited. In addition, the Ford Airport, which in one year has become a center of manufacturing and operation development, was for the first time thrown open to the public.

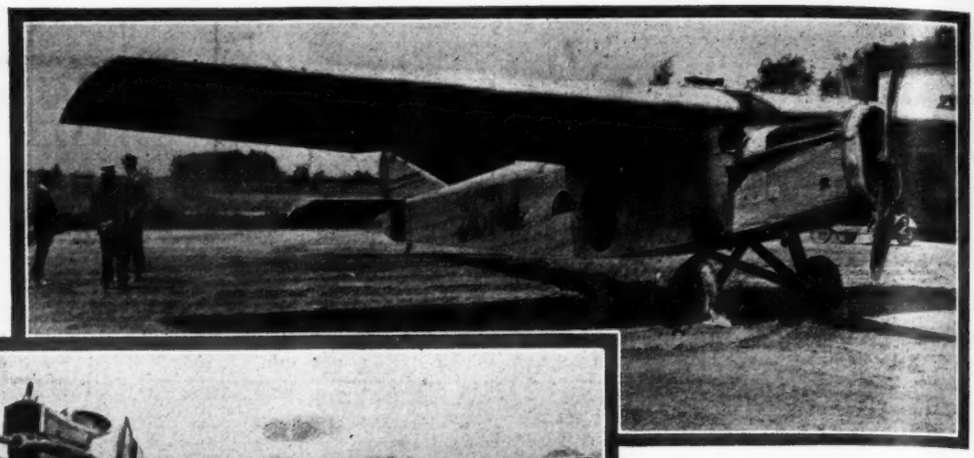
30,000 Persons Entertained

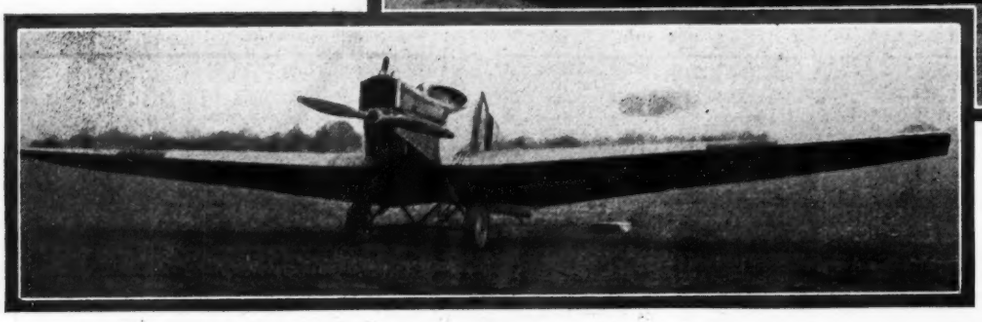
During the 7 days the tour was in progress, the spectators, sometimes numbering more than 30,000 persons, were entertained by the daily arrival and departure of the Ford freight airplanes carrying automobile parts and supplies between Chicago and Cleveland and Detroit, various airplane contests between local aviators, a balloon race and exhibition flying by army pilots on the latest types of machines. At intervals, groups of visitors were conducted through the factory where the Ford airplanes are being manufactured, and were allowed to inspect the airship mooring mast just completed, besides examining the airplanes which had assembled on the field from several outside cities.

Each of the first four planes to arrive may be regarded as representing the latest developments in present day airplane design. The first trio were thick winged monoplanes, two being single engined and of all-metal construction. One particularly significant lesson can be learned as the result of the tour; future commercial airlines operated on long routes must be of the most modern design with ample reserve of power to enable them to outride ordinary storms and to maintain schedules with the utmost regularity. The small low powered planes must be confined to local transportation requirements and the general utility purposes to which this type of craft is best adapted. Our future aerial freight carriers must have large regular and specially prepared fields to operate from, just as ocean

Edsel Ford (center) who acted as the official starter of the Reliability Tour when the planes took off on their 1900-mile flight from the airport at Dearborn, Mich.

Below, Junkers plane, a German entry





Above, the Ford air transport which participated in the Reliability Tour

vessels have their specially constructed berths. The smaller types of planes will always be able to find a landing place in the numerous fields scattered over the country.

In no respect was the tour supposed to be a race. Prizes were awarded to those machines which maintained the most regular time on a predetermined schedule and conformed with certain technical requirements, such as carrying a "pay load" of 0.5 lb. per cubic in. of piston displacement and similar demands. All planes had to be capable of a minimum 80 m. p. h. air speed and able to carry a passenger besides the pilot.

Trophy Awarded Annually

Each pilot starting in the tour was given an expense allowance of $100 upon completing the first leg of the tour and those returning to the starting point in specified time were allowed an additional prize of $250.

The Edsel Ford Trophy is to be awarded each year hereafter to the manufacturer of the winning machine, who shall be entitled to its possession until the next succeeding contest. Each airplane finishing the tour within the requirements will entitle the name of its entrant to be engraved upon the trophy and will count as the first step toward its permanent possession. Any manufacturer winning the trophy five times in succession will receive it as his permanent property.

Starting from Detroit on September 28, the planes touched at ten mid-western cities, including Fort Wayne, Chicago, Omaha, St. Joseph, Kansas City, St. Louis, Indianapolis, Columbus, Cleveland and Detroit, arriving back at the Dearborn Airport on October 4. The original schedule called for the return of the ships on October 3, but on account of exceptionally bad weather it was agreed to spend a day in Indianapolis. In spite of encountering several severe rain and thunderstorms and taking heavily laden ships off rain-soaked field sometimes half under water, the predetermined schedule was maintained with precision by all planes up to the last leg when the temporary delay was called by contest officials. In one particular instance the tour planes left on schedule when the weather was considered too bad for the regular air mail planes to make their regular trips.

Commencing with figure zero, the planes were numbered in arithmetical progression by even numbers, the figures indicating the number of minutes after the hour and the order in which they were to start. Thus each machine at the various checking stations departed in the same order every time, each having a two minute headway. One of the two planes not completing the tour was damaged in taking off from a soggy field, while the other was forced down near the finish with engine trouble.

With the exception of the German engine in the Junkers plane, all power plants were of American construction, the engines in the Dutch Fokker being Wright "Whirlwinds" of 200 h. p. each. Fokker was the only contestant to adopt air-cooled engines and to employ more than one power plant to propel the machine.

Excluding the Glen Martin ship, the balance of the planes not already mentioned were mostly of the small two-seater biplane type powered with Curtiss 90 h. p. engines. These small planes showed remarkable performances. Both the larger planes as well as the two-seater variety have showed a marked improvement in design and performance over similar ships of corresponding characteristics which were in operation a year ago.

IF nickel plating is used on exposed steel parts of automobiles and for similar work, the coating should be at least one-thousandth of an inch thick, according to the findings of the Bureau of Standards, Department of Commerce. If the film of nickel is thinner than this the finish will not be durable.

It has long been recognized that nickel plating as ordinarily applied does not yield satisfactory protection against the corrosion of iron and steel parts. An investigation of this subject by the Bureau of Standards has confirmed the work of others, and has shown that this failure to protect is due to the fact that the nickel coatings are almost invariably porous. It was not found possible to produce by any practicable method coatings which are entirely free from porosity. It was found, however, that if the nickel plating is made considerably thicker than is necessary or customary upon brass parts, the protective value can be very materially increased. It is believed that one one-thousandth of an inch is the minimum thickness that should be employed.

Just Among Ourselves

At Home— In Philadelphia

WE'VE moved. The operation wasn't so simple as the statement, but it was a good bit less complicated matter than we had anticipated. After closing out the New York era with the Production and Factory Equipment Issue, *Automotive Industries* loaded its Lares and Penates on to a lot of trucks and shipped them over to Philadelphia. The Oct. 1 issue was published in the City of Brotherly Love and Trick Traffic Rules. So here we are all settled at 56th and Chestnut Streets along with the rest of the Chilton Class Journal Co. magazines which have been here before. *Motor Age* remains in Chicago where it always has been.

Riveting Hammers As an Aid to Thought

PROBABLY we ought to look back with regret on the breaking of Metropolitan ties, but it is sort of difficult to do, because we seem to remember from back in our college days that being in Gotham as a visitor provides a lot of thrills that residence there makes impossible. And we have every expectation of being a frequent visitor. What's more, we can't get many large tears in our eyes about leaving behind the merry rat-a-tat-tat of riveting hammers which has furnished the musical accompaniment during the last three years to the automotive symphonies which we have been composing. Now that the music has been left behind maybe we'll be able to improve the words.

People Matter Far More Than Things

AND after all, our love for places and things never is so vital as our feelings for people. And in this case we haven't so many personal ties to wrench loose. We are going to be back in New York often enough to keep in close touch with all of our friends there and the entire editorial staff of A. I. has come to Philadelphia intact. We might ramble on about the future in the Bigger and Better strain so much beloved by American Babbitry, but you wouldn't like it and neither do we. If you keep on following the magazine and still read the automotive meanderings of *Just Among Ourselves* you'll decide what you think of our progress. So we won't bother you with any more of our personal reminiscences, except to say that we'll be mightly glad to see you when you come to Philadelphia and to hear from you about anything you have on your mind whenever the spirit moves you to write.

British Feelings on American Motor Invasion

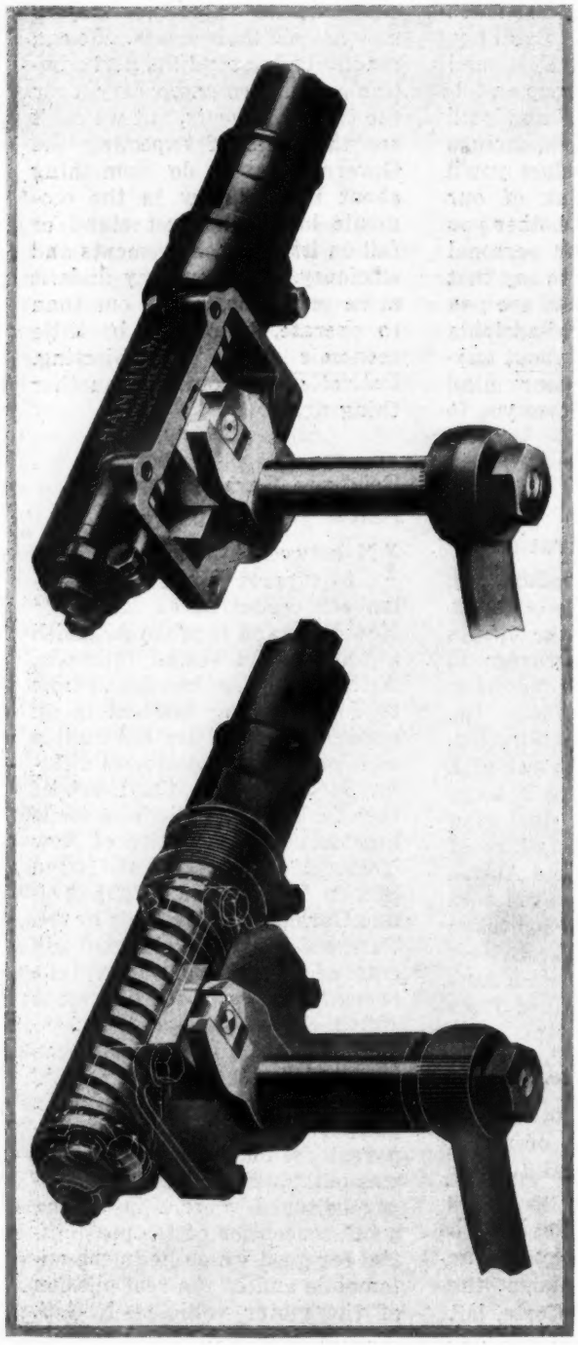
THE British motor industry in general seems not to be favorably impressed with the efforts of American manufacturers to gain control of British factories. A recent issue of *Motor*, the British Dangerfield publication, says editorially that "it was with a feeling of relief that a large part of the British motoring public learned of the failure of negotiations between the Austin Co. and the General Motors Corp." Had the acquisition taken place, *Motor* argues, the British public which bought British Austins would have refrained from buying American Austins. Consequently, to get the market, the Americans would have had to go ahead to buy up the other factories to the products of which the British buyers had turned. The final result would be, *Motor* thinks, domination of the British industry by the American. The editorial does not blame the Americans for their efforts, but thinks that "it should be by some means the business of the State to see that such things shall not come to pass." Just what that last phrase may mean we don't pretend to know; the British Government hardly could be expected to step in and tell British companies to whom they may or may not sell their assets. We can readily understand the perturbation of our contemporary over the trend of events, but we can't see the logic of expecting the Government to do something about it. Industry in the economic long run must stand or fall on its own achievements and efficiency. If a company finds it more profitable to sell out than to operate, there can be little economic reason for objecting. Patriotism, of course, is another thing again.

Brisbane Garage Brings Editor Into Industry

IN between his current efforts to support Honest John Hylan for reelection as Mayor of New York and to prove Al Smith a tool of the vested interests, Arthur Brisbane has found time to do something unusual in an automotive way. He has built a huge garage equipped with d'Humy Motoramps in the heart of the fashionable Fifth Avenue apartment house section of New York. It is located at 102nd Street. The Brisbane Fifth Avenue Garage is being built by the Turner Construction Co. and will cost over $500,000. It will be operated by the Fifth Avenue & 102nd Street Garage Corp., to whom the building has been leased. Whatever any individual may feel about Mr. Brisbane's political views, it has been apparent for many years that he was outstanding among newspaper editorial writers in having a full conception of the possibilities for good which lie in the automobile and of the real mission of the motor vehicle.—N. G. S.

New Hannum Steering Gear Provides Variable Leverage

Gives greatest mechanical advantage in extreme positions. Guards against the transmission of shocks to driver's arms



The new Hannum steering gear with cover plate removed and in phantom view

RECENT changes in automobile design, such as the introduction of the balloon tire and of four wheel brakes, have carried in their train new problems for the designer and manufacturer of steering gears, for it is well known that particularly the use of balloon tires adds materially to the effort required to deflect the front wheels from the straightahead course. Among those who have been studying this subject are George H. Hannum and T. Ray Johnson, both of whom have had extended experience in the steering gear business, and the result of their studies is embodied in a new steering gear to be manufactured by the Hannum Mfg. Co. of Milwaukee.

The Hannum gear gives a larger mechanical advantage when in the extreme positions than when in the central position, and this is claimed to be an advantage for the following reasons. It was found during the course of the research work that with cars in which the knuckle pin axis is inclined toward the vertical, when the steering wheels are swung from either extreme to the central position, the front of the car is lifted as much as 3/16 or even ¼ in. Moreover, the rate of lift is not the same throughout the range of steering motion, but is greatest toward the ends. The energy necessary for lifting the car, of course, is supplied by the driver in moving the steering wheel, and owing to the greater rate of lift of the car when the steering wheel is near the extreme positions, the resistance to its motion is naturally greatest in that case.

Trunnion Block Pivot

Another factor that has a bearing in this connection is that while extreme deflection is unusual in normal driving, it occurs regularly in parking, when a car has to be manoeuvred in restricted space, and the front wheels must often be deflected from their course while they are not turning. To take care of the greater resistance to the deflection of the front wheels when they are near their position of maximum deflection, the Hannum steering gear is so designed as to provide a greater reduction ratio when in that position. It is also claimed that in ordinary driving, when the deflections of the steering wheels from the central position are small, the driver enjoys the greatest degree of comfort if a given movement of the steering wheel produces a maximum deflection of the road wheels.

A trunnion block pivoted on a pin integral with the nut connects through the forked jaws of the rocking shaft to the steering pitman arm. At the extreme travel the nut has moved to the end of the screw thread, and the trunnion block has moved out further along the jaws, thereby increasing the leverage to operate the pitman arm. Obviously, this sliding of the trunnion block increases the gear ratio. This feature of the changing gear ratio has

the effect of giving decreased steering effort at extreme travel while parking, and lessened movement of the steering wheel while driving, as compared to a steering gear of fixed ratio.

Of course, the smaller the ratio of reduction the higher the degree of reversibility of the gear, and the more reversible the gear the greater the transmission of shocks to the driver's arms. In the Hannum gear, provisions are made to relieve this shock. By reference to the pictures it may be seen that any shock on the pitman arm is transferred to the nut by the trunnion pin, which is not at the center of the nut. This causes a momentary rocking action (or, rather, a tendency to rock) of the nut block, whose face is fitted accurately to the gear housing. A thrust is imposed on this face and tends to force the lubricant out from between the opposing faces, the lubricant acting as a cushion to absorb a part of the blow.

The question might be raised as to how this lubricant, once squeezed out from between the sliding surfaces, gets back again. The answer is that the nut acts as a pump plunger, forcing the lubricant throughout the housing and over all of the interior surfaces. This automatic lubrication feature has an important effect on the ease of steering and the life and serviceability of the gear.

In the medium car size the nut threads have a bearing area of 1 sq. in. while truck and bus sizes have up to 5 sq. in. bearing area. The screw itself is of S. A. E. No. 1020 steel, case-hardened, and accurately ground after hardening. The nut is of the same steel, also ground after hardening. The trunnion shaft and trunnion blocks are of S. A. E. No. 2145 steel, heat-treated, and in this connection it is worth noting that each piece is given a Rockwell test for hardness. The housing is of malleable iron and all bearing strips and faces are milled in jigs to secure proper alignment.

To allow the trunnion block to swivel slightly and align itself in the forks of the rocking shaft, its surfaces are slightly curved in the axial direction. The ball bearings used are of the combined radial and thrust type.

By grinding the housing surfaces and making use of a gasket, the gear is rendered oil-tight and therefore can be lubricated with oil. Finally, the gear is interchangeable with the worm and sector type and is said to be lighter in weight.

The shop in which these gears are manufactured is a modern saw-tooth roof building, having heat-treating, enameling and plating departments. The progressive system of manufacture is used.

Chemical Show Holds Interest for Automotive Men

THE Tenth National Exposition of the Chemical Industries at Grand Central Palace, New York City, the week of Sept. 28th, was the largest of its kind yet held. There were two general classes of exhibits, viz: products of the chemical and metallurgical industries and equipment for chemical and metallurgical plants.

As usual, there were many points of contact with the automotive industry. Thus the Ford Motor Co. had a striking exhibit comprising models of its wood distillation plant at Iron Mountain, Mich., and its coal distillation plant at River Rouge. Among the products of the first-mentioned plant, samples of which were shown, are briquetted charcoal, a smokeless fuel, wood alcohol and ethyl acetate, the latter used in the manufacture of artificial leather. Benzol, a motor fuel, is the product of chief automotive interest of the coal distillation plant at River Rouge, though the principal product, metallurgical coke, plays an important though indirect part in the production of motor vehicles.

Electrical Exhibits

Interesting exhibits of an educational character were shown by the two large electric corporations. The General Electric Co. showed a slab of Glyptal, a new synthetic resin developed by its research laboratory. An automatic arc seam welder was shown, which on such work as domestic range boilers produces a seam at the rate of 18-24 in. per minute. Another exhibit of an industrial character was a direct heat electric furnace. Samples were shown of fused quartz, which was first produced in the General Electric Research Laboratory something over a year ago. The development of the art of electrical insulation was interestingly portrayed by numerous samples.

At the Westinghouse booth, there were shown samples of a new alloy magnet steel which is claimed to have four times the coercive force of ordinary magnet steel. A magnet weighing 300 grams supports a bar of iron weighing 4500 grams. One of the applications of this new magnet steel is in the Westinghouse oscillograph, the horseshoe type magnet which produces a magnetic field of 7,000 gauses (100,000 lines of force per square inch). Westinghouse has played a prominent part in the development of radio, and among the exhibits was a 10 kw radio transmitter tube as used by numerous of the more powerful broadcasting stations.

Of more direct automotive interest was the exhibit of Micarta silent non-metallic gears. A new resistance alloy, negatan, was shown in the form of samples, which has a negative resistance coefficient, that is, its electrical resistance decreases with an increase in temperature. This alloy is used chiefly in electrical measuring instruments to make their indications independent of atmospheric temperature. Samples were shown also of chromium plating work and of duetile thorium.

Other Industries There

The industry devoted to the manufacture of high range thermometers, recording thermometers, pyrometers and temperature control devices was well represented. Likewise the abrasives and refractories and the heat insulator industry.

In connection with the show there were held a number of meetings of the American Chemical Society. Three of these meetings were devoted to a symposium on Motor Fuel and Oil Conservation. At the first meeting, on Tuesday morning, K. G. Mackenzie, of the Texas Co. spoke on "Petroleum Aspects of Oil Conservation"; at the second meeting on Wednesday morning, two papers were presented, one by Milton C. Whitaker, president of the U. S. Industrial Chemical Co., on "The Fermentation Industries and Motor Fuel," the other by A. C. Fieldner, superintendent of the Pittsburgh Station of the Bureau of Mines, on "Complete Utilization of Coal and Motor Fuel." C. F. Kettering, president of the General Motors Research Corp., was the speaker at the final fuel session, his topic being "Motor Design and Fuel Conservation."

Motion pictures were shown each afternoon and evening. Most of the reels presented dealt with some phase of the chemical industry but on Thursday evening a number of automobile reels were shown.

Plea for Better Automotive Steels Made at Gear Meeting

Reo Motor Metallurgist Says Greater Uniformity in Quality is Needed. Specifications for Basic Rack Are Adopted as Recommended Practice. Standards Discussed

By P. M. Heldt

A PAPER of outstanding automotive interest among those read at the meeting of the American Gear Manufacturers' Association at West Baden, Ind., Oct. 1, 2 and 3, was that on "Improvements Needed in Automotive Steels," by Walter G. Hildorf, consulting metallurgist of the Reo Motor Car Co.

Mr. Hildorf said everyone having to do with the selection and checking of steels used in automotive construction constantly runs up against difficulties. He expressed the view that what was needed most to meet automotive requirements was not the development of entirely new steels but of ways and means for making steels more nearly uniform from heat to heat—uniform as regards strength, hardness, warpage and resistance to wear.

Perhaps the most important action taken in the line of standardization was the adoption, as Recommended Practice, of specifications for a basic rack for the 14½ deg. modified involute system of gearing. This defines the form of a rack tooth which can be used to generate the teeth of a system of gears from a 12-tooth pinion to a rack, that will mesh satisfactorily with each other and also with gears cut with Brown & Sharpe disk cutters.

President's Address

President J. E. Frost opened the meeting with a brief address in which he emphasized the fact that the mechanical world is watching the Association and yielding it recognized leadership in gear standardization. Standardization at best is a slow process, he said, and the fact that the Association must of necessity co-operate with other engineering bodies further retards the rate of progress. It is to be expected that any standards adopted by the A. G. M. A. will become not only U. S. standards but world standards.

President Frost advocated co-operation with educational institutions with respect to the solution of technical and scientific problems affecting the industry as a whole, and said such co-operation would have a broadening effect all around. He also referred to discussions with certain branches of the Government with respect to simplification and rationalization of specifications used in connection with purchases for Government departments. Millions of dollars, he said, are squandered annually on drawings that could be greatly improved.

Chairman B. F. Waterman of the Standards Committee made reports for that committee and for the Sectional Committee on Gearing of the American Engineering Standards Committee, in which he briefly reviewed the work done by the various sub-committees the past half year.

Mr. Hildorf in his paper on automotive steels said metallurgy is still a comparatively new science and metallurgists by no means are of the same mind with respect to all specifications, but certain recommendations can be made from which hardly anyone will dissent. He referred to the trouble caused by pipes, seams and non-metallic inclusions in steel, which latter in the first place are probably in the bulbous form and are drawn out in the process of rolling, forming the so-called stringers.

We expect to print Mr. Hildorf's paper with illustrations in an early issue of *Automotive Industries* and will confine ourselves here to a summary of the points made by him.

Steel Requirements

The steel companies should maintain a system of inspection such that seamy stock, which would cause the customer trouble, would be caught before leaving the mill. It should be possible to obtain a more uniformly dense structure, i.e., freedom from soft, spongy centers.

Improvements have been made in the cleanliness of steel, yet the average quality is not satisfactory to the automotive metallurgist. Regardless of whether or not it is possible, by the use of salt baths, to harden abnormal steels, the fact remains that abnormal steel is more prone than normal steel to give soft spots. Therefore, it is hoped that the steel companies will find it possible to so improve their practice that abnormal steels can be eliminated.

Fracture testing opens up a wonderful field for the improvement of automotive steels. Grain size varies enormously from heat to heat. It is hoped that work along this line will be pushed, because fine grained normalized steels seem to be much better than coarse grained steels.

J. L. Williamson, research engineer of the Fellows Gear Shaper Co., read a paper on "Measuring Gear Teeth." He enumerated some of the dimensions that are usually inspected, discussed various methods of measurement and pointed out possible causes of error.

Measuring Gear Teeth

As a rule, no absolute measurements are made of tooth thickness, space width and circular pitch, but variations in these dimensions are checked by taking relative readings. The fixture for checking the thickness of the teeth is set near the pitch line. Another setting is required for the space width, which is also taken near the pitch line. A third setting permits of making a comparison of the circular pitches on one side of the teeth, and a slight change-over of the machine, doing the same thing with respect to the pitches on the other side.

If not the true chord of the tooth thickness or space arc, but a line making an angle with this cord is measured, then the effort exerted is wasted.

Mr. Williamson described and illustrated a number of methods of measuring tooth thickness and width of space, and also dealt at some length with methods of inspection and qualifications of inspectors. We expect also to abstract this paper *in extenso* in an early issue of *Automotive Industries.*

Eliot A. Kebler, president of the Fawkus Machine Co., Pittsburgh, Pa., presented a paper on "Machine-Hour Rate the Ideal Foundation for Gear Estimates and Costs." He briefly traced the development of cost accounting in the machine shop industry during the past 40 years, pointing out the crudeness of the early methods. Even today there are firms who can judge their profits only by the increase in their bank accounts, if any.

Uniform Cost Accounting

The excellent work done by the Uniform Cost Accounting Committee of the association shows that the machine-hour rate is the proper basis for pro-rating shop overhead when the machines used differ widely in cost. All direct labor and material used is, of course, charged to the particular job, and the machine-hour rate serves to pro-rate the indirect manufacturing cost to a bench hand, erector, fitter or machine. Administrative and selling expense is usually pro-rated according to productive hours.

The chief advantage of the machine-hour rate is that each machine carries a burden proportionate to its cost of operation. One company, for instance, has seven rates, rate No. 6 being six times rate No. 1. The rates are fixed by a survey of the plant and by comparing the costs of operating the different machines.

Depreciation on buildings and equipment, insurance, rent, heat, light and taxes are apportioned to the different machines according to the floor space occupied by the machine and its operator; the total cost of power is divided among the machines according to the horse power consumed, and the depreciation of the machine and the cost of tools used with it are determined separately.

What makes the machine-hour rate particularly advantageous is that under it the very expensive machines carry their true shop burden, instead of the same as that of a fitter or a small drill press. Everything is in favor of the machine-hour rate, which is the one safe and scientific method for the distribution of shop overhead.

Preparing Estimates

In preparing an estimate for a bid it is necessary to determine accurately what the cost will be, and this can best be done by the machine-hour method. If this scientific method were used more there would be fewer ridiculous bids, and on the whole profits would be more satisfactory. Many other associations have reaped great benefits by the introduction of uniform methods of cost accounting and the work done by the Cost Committee has shown the members of the association how these advantages can be had in the gear industry.

Prof. C. W. Ham of the Engineering Experiment Station of the University of Illinois presented a paper on "Some Recent Development in Gear Research," prepared by himself and J. W. Huckert. In this paper there was given a review of the history of research work on the efficiency, durability and strength of toothed gearing, and an account of some work along this line done at the Illinois Experiment Station with a machine built for the University by Wilfred Lewis in 1916. The tests were made on unhardened gears and covered both efficiency and durability.

All efficiency curves showed an efficiency of over 99 per cent and this maintained under variations of load to practically zero. This apparently very high efficiency is probably due to the fact that in most other determinations of gear efficiency the losses in the bearings are included with those at the teeth.

A very happy note was struck in a luncheon talk on Commercial Air Transport by Brig.-Gen. J. E. Fechet, assistant chief of staff of the Air Service. In speaking of the prospects of commercial air transport, he said that in Europe commercial aviation "had arrived" but there was no such thing as yet in this country. Business was closely allied to transportation. What business wanted was rapid transportation. In the future air transportation probably would bear the same relation to rail transportation as the latter now bears to the slower water transportation.

In the development of commercial aircraft, gear makers were destined to play an important part. This was due to the fact that the best modern aircraft engines delivered their maximum output at about 2000 r.p.m., while air propellers reached their maximum efficiency at about 1200 r.p.m. Above that speed there was too much slippage. Hence a reduction gear was needed, giving a reduction from 5:3 to 2:1.

Aircraft Reduction Gears

Two types of gear had been experimented with, the ordinary direct reduction gear with herring bone teeth and an epicyclic type of gear. One advantage of the latter was that tooth pressures were very much reduced. The great difficulty of the gear problem lay in the fact that enormous horse powers had to be transmitted with gears of little bulk and weight, hence the tooth pressures were necessarily high and trouble was experienced from back lash when the throttle was suddenly closed, which had a tendency to strip the teeth. This stripping of teeth even happened with direct reduction gears, in which the back lash need not be as great.

As an example of the advantage of reduction gears, Gen. Fechet mentioned the case of the army transport plane which when fitted with a Liberty engine with the propeller directly on the crankshaft could not get off the ground, whereas when fitted with a 2:1 reduction gear it hopped off in 200 feet.

Gen. Fechet ventured the opinion that the recent disaster to the Shenandoah would not seriously affect development of the lighter-than-air type of craft, which had a great future in rapid transportation over long distances, across the oceans as well as over land.

Stanley P. Rockwell, consulting metallurgist to the A. G. M. A. and president of the Stanley P. Rockwell Co., Hartford, Conn., presented details of a method of hardening steel parts in accordance with the readings of an expansion indicator or dilatometer, instead of by the readings of a pyrometer.

Hardening by Dilatometer

The part to be hardened is placed in a furnace (in production hardening the parts are stacked in the furnace) and a quartz tube resting on top of the part bears against a multiplying lever operating a dial gage. When the part becomes heated it expands and the expansion causes the hand of the dial gage to move. The multiplying lever is of such proportions that an expansion of 0.0079 in. results in one complete revolution of the dial gage.

When the point of decalescence is reached, which corresponds to the temperature at which the steel part should be quenched for most effective hardening, the expansion ceases and the part begins to contract. This is indicated by a reversal of the motion of the dial hand.

In addition to the quartz tube, multiplying lever and

of the hp. capacity of spur gears composed of laminated dial gage the dilatometer comprises a recording drum on which a time-temperature record is traced by a pencil carried by the end of the multiplying lever.

Hardening by the dilatometric method is said to be superior to hardening by pyrometer because with the dilatometer there is no lag in the temperature of the part behind the temperature indicated, which lag must be allowed for.

An extension of the dilatometer method is now being worked out whereby the expansion of the parts to be hardened is made use of to close electrical contacts and thus set in motion conveyors for transporting automobile transmission shafts from a preheating to the regular furnace and thence to the quenching bath and tempering bath.

The Commercial Standardization Committee, E. A. Kebler, chairman, has revised so as to cover both the automotive and the industrial branch of the industry, a questionnaire calling for data from which each company each month could readily determine its percentage of operation.

The Tooth Form Committee, whose recommendation for a basic rack for the 14½ deg. modified involute system of gearing was adopted as recommended practice, has been working on this problem for a number of years. This form of rack tooth is understood to be substantially the same as that on which the Brown & Sharpe disk cutters are based. The form of the rack as recommended in the report was first discovered or identified by Earle Buckingham in 1922. The tooth outline is composed of an involute (straight line) on both sides of the pitch line, of a length equal to 0.77703/DP, and cycloids above and below this portion of the tooth side.

Form of Basic Rock

The reason for the use of the cycloid at the top and bottom of the tooth is said to be that it gives a greater number of teeth simultaneously in contact, and thus results in more quiet action. This was confirmed by the experience of a committee appointed by the American Society of Mechanical Engineers some twenty years ago to standardize tooth forms. This committee started out to standardize the true involue form of tooth but reported that teeth cut with commercial disk cutters ran more quietly and the proposal was therefore dropped.

One moot point in connection with the newly adopted form of tooth is what will be the character of the line of action corresponding to the cycloid portion of the tooth when the gear generated has more than twelve teeth. For twelve teeth this line is an arc of a circle.

Mr. Eberhardt said the Tooth Form Committee had been asked to investigate European railway gear practice especially with respect to long and short addendum gears, with a view to standardizing American practice. The committee, he said, was also collecting data on the ease-off required on the theoretical outline of the teeth to accommodate various ratios under conditions of housing and tooth deflection. From the Illinois Tool Works a request had been received to work out the outline of a hob tooth with which it would be possible to generate gears that would mesh satisfactorily with gears cut with disk cutters and Fellows involute cutters.

The Committee on Non-Metallic Gearing at a previous meeting decided to omit from the list of tests to be applied to that class of materials the so-called tensile split test and to distribute the points previously allocated to that test among the remaining four tests, as follows: 2 per cent each to the impact, transverse and deflection tests, and 3 per cent to the compression test. All tests are made both parallel and perpendicular to the grain. All of the test results obtained with the six materials of this class were recalculated and retabulated on the new basis, according to which the different test results are given the following ratings: Impact parallel to grain, 18 per cent; perpendicular to grain, 5 per cent; compression, parallel, 23 per cent; perpendicular, 8 per cent; transverse strength, parallel, 21 per cent; perpendicular, 10 per cent; deflection, parallel, 10 per cent; perpendicular, 5 per cent.

By this method the six different materials tested rate as follows: No. 1, 100 per cent; No. 2, 89.06 per cent; No. 3, 89.75 per cent; No. 4, 84.82 per cent; No. 5, 98.93 per cent; No. 6, 70.29 per cent. The report was accompanied by tables giving the results of each test on each material, both in absolute figures and in terms of percentage of the maximum value obtained in that test.

Hp. Formula for Non-metallic Gears

This committee also submitted for adoption as Recommended Practice the following formula for the calculation of the horse power capacity of spur class composed of laminated phenolic materials or rawhide:

Hp. = (0.000095 s fw y)/dp, where.
Hp. = horse power.
s. = safe working stress (which varies with the speed in accordance with the formula given below):
fw = face width in inches;
y = Lewis constant for number of teeth;
dp = diametral pitch.

Six thousand pounds per square inch was set down as the safe working stress under static load, and the safe working stress *s* at different pitch line velocities pvl in ft. p. min. was to be determined by the formula

$s=600/(600+pvl)$.

It was objected to this formula that it differed from the standard Lewis formula in being based on the diametral instead of the circular pitch. There was said to be no need for a special horsepower formula for non-metallic gears. Such a formula should be of a general type, applying equally to gears of all materials, suitable values being inserted for the allowable stress for the different materials. It is this stress factor which the committee should determine.

Exception was taken also to the proposal to make use of the Barth velocity factor 600/(600+pvl), originally evolved for cast iron. It was pointed out that experience had shown that the non-metallic materials could not support as great a static load as cast iron, but a greater dynamic load at considerable speed, this being due to the greater elasticity of the non-metallic material. An expression should therefore be evolved for the velocity factor which would give a flatter curve. Experiments on gears of these materials might be made in the Lewis gear strength testing machine, in order to obtain a basis for such an expression.

Steel Casting Specifications

The Committee had compiled tables of the horsepower capacities of a wide range of sizes of non-metallic gears, but owing to the non-acceptance of the expression for the velocity factor these will have to be recalculated later. It was decided to circulate the tables privately among the members. The work of the sub committee in general was highly commended.

The Metallurgical Committee, of which Chester B. Hamilton, Jr., is chairman, submitted a proposed Recommended Practice covering steel castings for gears, to supersede a Recommended Practice adopted by the Association in October, 1921.

Steel castings for cut gears are to be purchased on the basis of chemical analysis, and only two analyses are to be used, one for gears that are to be case-hardened, the other for gears that are to be left untreated as well as for

gears that are to be hardened and tempered. The steel is to be made by either the open hearth, crucible or electric furnace process, not by the converter process.

Sufficient risers are to be provided to insure soundness and freedom from undue seggregation, and the method of removing the risers is specified. All steel castings for gears must be thoroughly normalized or annealed, using such temperature and time as will entirely eliminate the characteristic structure of unannealed castings.

The following chemical compositions are called for:

Use	Class	Carbon	Manganese	Phosphorous Acid	Phosphorous Basic	Sulphur
Case-hardening	C	.15-.25	.40-.60	.06 max.	.05 max.	.06 max.
Untreated or hardened	H	.30-.40	.40-.60	.06 max.	.05 max.	.06 max.

The Recommended Practice also covers such items as Ladle Analysis, Check Analysis, Finish, Marking, Inspection, Rejection and Rehearing. Cast steel gears, of course, are used mainly for industrial purposes.

Gear Nomenclature

The Nomenclature Committee, for which a report was presented by Douglas Hamilton, had confined its work to the assignment of symbols or abbreviations to such elements of gear teeth as have dimensional values. In the selection of these abbreviations the rules given in the next paragraph were followed. These rules, by the way, make it possible for any one to form his own abbreviation for any element that may not be covered by the recommendations of the committee.

Where there are two or more words in the name, the first letter of each word is used, and these letters, in capitals, are placed in the same order as the words describing the element. Where there is only one word and a possibility of conflict, use the first letter of the word as a capital and the first letter of the second syllable in lower case. Where there is only one syllable and a possibility of conflict, use the second letter in lower case.

Angles are designated by the letter V; for instance, VP designates pressure angle. In formula work, to differentiate between pinion, gear and intermediaries, use sub letters p and g for pinion and gear, respectively, and sub numbers 1, 2, 3, etc., for the first, second and third intermediaries. For instance, the numbers of teeth are designated by Np, Ng, N1, N2, etc.

The Worm Gear Committee, J. C. O'Brien, chairman, has worked out a horse power formula based on the strength of teeth, the derivation of the formula being given. It is now proposed to obtain from members data regarding successful worm gear drives from which it is expected to derive the values of the constant in this formula for different classes of service, such as open or enclosed, continuous or intermittent load, hardened and unhardened worms, etc. The report was adopted as a progress report.

Progress of Research Work

It appeared from the report of E. W. Miller, chairman of the Research Committee on Gears, that some difficulties have been run into with the Lewis gear testing machine at the Massachusetts Institute of Technology and that these are being ironed out. The character of the research work planned is such as to require utmost care in details, and it was therefore decided to proceed cautiously. However, it is expected to have valuable results ready for presentation at the next meeting.

Directions for the inspection of gear cutters of the disk type submitted by the Inspection Committee, F. G. Eppley, chairman, were adopted as Recommended Practice. They cover tests for hardness, diameter and roundness of bore, size and alignment of keyway, wobble, concentricity and radial sharpening, concentricity of form, tooth form thickness and tooth form outline by the lantern and the gage methods.

The chairman of the Differential and Transmission Committee, S. O. White, was not present, and a report was made by A. E. Grater, one of the members of the committee. It dealt with nomenclature, giving names of all the parts of a standard type automobile transmission. This was adopted as a progress report.

The Spur Gear Committee, J. L. Williamson, chairman, had a progress report only. It is now working on tolerances for holes and plans to circularize members as to whether they prefer positive tolerances only, negative tolerances only or both positive and negative tolerances.

The Keyway Committee, which had a new chairman, R. B. Zerfey, engineer, Tool Steel Gear and Pinion Co., Cincinnati, made a progress report. It appeared from this that the Sectional Committee on Keyways of the American Engineering Standards Committee has proposed a standard giving sizes for both square and rectangular keys for all sizes of shafts from ½ in. to 6 in. diameter. The A. G. M. A. Committee favors a single standard but would like to include keys for shafts from ¼ to 12 in. diameter.

The next meeting of the Association will be held in Detroit in May, 1926, date and hotel to be announced later.

Fuel Alcohol From Nipa Palm

CONSIDERABLE work has been done in the Philippines in ascertaining the commercial practicability of producing motor alcohol from the sap of the Nipa palm, and quite recently an experimental plant for the same purpose was erected in the State of North Borneo. This plant is being run under the direction of the local Department of Agriculture, and an account of the results of the first year's working, based on a memorandum supplied by the British North Borneo Company, is given in the current number of the *Bulletin* of the Imperial Institute.

There are about 300,000 acres of Nipa palm in North Borneo, occurring in nearly solid stands of 5000 acres or more. The sap flows for only six months in the year, but it is estimated that during that period 900,000,000 gallons of sap capable of producing nearly 60,000,000 gallons of alcohol could be obtained. The results of the first year's working of the experimental plant came up to expectations in every way. The still was only capable of producing 100 gallons of alcohol per working day of twelve hours, and the costs of running such a small plant were naturally somewhat high, but it is shown that a permanent plant, producing not less than 1000 gallons per day, should prove a commercial success. Estimates are quoted in the article of the cost of production for plants of various capacities. For a plant capable of producing 2000 gallons per day of twelve hours, the capital required is estimated at about L26,000, and the profits on the spirit delivered in Singapore or Hong Kong would be equivalent to a dividend of 10 per cent on the capital. An 8000-gallon plant run for twenty-

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A NEW determination of the exponent y in the equation PVy constant of the gas engine diagram has been made by Andre Planiol, and a report on the research was made to the F rench Academy of Sciences by M. C. Koenigs. It was found that for both the compression and the expansion line y has a mean value of 1.30. Pressure curves calculated with the aid of this exponent at no point varied from the actual indicator diagrams by more than 0.3 lb. p. sq. in.

Left—Milton in his Duesenberg leading the field in the 1925 Italian Grand Prix. Center—Brilli Peri, winner of the Grand Prix, stops to change a tire on his Alfa Romeo. Right— De Paolo flashes past the stands in an Alfa Romeo.

American Cars Prove They are Match for Fastest in Europe

Duesenbergs make good showing in Italian Grand Prix, although handicapped by conflicting rules. Move is started to recognize A. A. A. as the U. S. authority in international racing hereafter

By W. F. Bradley

THE Italian Grand Prix was run and the results published in *Automotive Industries* several weeks ago but there are some details of the affair which have not yet been told and I believe a narrative dealing with a few of these will be of interest to American readers.

If American cars failed to capture the race and bring the world's automobile championship to their side of the Atlantic, they at least proved their right to be matched against the best in the Old World. Racing abroad presents difficulties which were enhanced in this case by the fact that the American Automobile Association does not possess an international voice.

European racing rules specify a 122 in. engine, a two-seater body 31 in. wide, with one man aboard. America races with single seater bodies. The two Duesenberg cars, which were driven by Milton and Kreis, arrived in Milan with the assurance that they would be allowed to race with two plates, 6.6 in. square, added to make their head resistance equal to that of the wider European cars. The organizers of the race, however, appear to have overstepped their powers in making this concession, and the jury insisted on 31 in. bodies being built. The rule that the two seats should be side by side was not enforced, and the American drivers sat in the middle while the European drivers were on the right.

It was found, under Monza track conditions, that the wider bodies did not decrease the speed of the cars in any measurable quantity, but the building of the new bodies involved a lot of time and reduced opportunities for practice. The Isotta Fraschini Company of Milan, acting in a generous sporting spirit, placed its entire factory resources at the disposal of the American team and Chief Engineer Cattaneo worked all night on several occasions with the drivers and mechanics. Without this assistance the Duesenbergs could not possibly have been ready for the race.

The difference between American and European rules caused friction and created a situation which needed very diplomatic handling. The root of the trouble is to be found in the fact that the American Automobile Association has no voice in framing what are described as international racing rules, for up to the present this power has been vested in the Automobile Club of America while the A. A. A. has had the controlling voice in national racing events in America.

The Italian racing authorities so completely realize the foolishness and the inconvenience of this situation that at the October meeting of the International Association of Recognized Automobile Clubs they intend to call for the resignation of the Automobile Club of America and the acceptance of the A. A. A. as the international controlling body.

This is much less of a sporting question than it would be in the United States. Hundreds of newspapers here have carried the news to millions of readers that the best European cars have defeated the best American machines. The connection between racing and industry is very close in Europe and success in racing is the final and incontrovertible proof, to the European mind, of superiority in design and construction. Any situation in America, therefore, which makes it difficult or impossible for an American team to race abroad under conditions of equality is an influence antagonistic to the best interests of the American automobile industry.

All the technical interest of the Italian race is to be found in the different methods adopted by Europe and America to attain the same results.

Alfa Romeo can be accepted as the European leader at the present time in the design and construction of

modern 122 in. racing cars and Duesenberg can claim a similar position in America.

European engineers were amazed to find that Duesenberg was getting results with a cheap and economical design and construction which they had been able to attain only by much more epensive methods. It was sometimes difficult to convince them that the Duesenberg engines had white metal for the main and connecting rod bearings, for their experience has been that only the more costly roller bearing and its special type of shaft will stand up on high efficiency engines running at 5000 revolutions and more. The use of a detachable cylinder head also created surprise, for European experience is that a joint at this point cannot be made gas tight.

There was nothing in common between the Alfa Romeo and the Duesenberg engines. The Alfa Romeo represents a European type developed first in the Fiat factory by such engineers as Cappa, Jano and Bertarione and now to be found, with various modifications, in half a dozen European factories.

Rootes Type Blower Used

Steel cylinders, roller bearings for crankshaft and connecting rods, two overhead camshaft with rear end drive by a train of spur pinions, and a Rootes type blower running at or about engine speed are the main features of this type of engine. Alfa Romeo made use of a special type of fuel, the nature of which was not revealed. According to the popular report—repeated for what it is worth—Mussolini had given orders that it should be kept secret in the interests of the nation. It was only necessary to stand near the cars to realize that there was an important proportion of wood alcohol and ether in the composition.

This special fuel enabled a compression ratio of 7.5 to 1 to be used. The pressure obtained by the blower could not be ascertained. Other European firms have employed an equally high compression ratio, but when a supercharger has been added they have had to reduce it. Only the special fuel allowed the higher pressure to be used on the Alfa Romeos.

European racing cars, without exception, use the Rootes type blower, Alfa Romeo, Fiat, Diatto and Mercedes placing it before the carburetor and Sunbeam and Darracq placing it after the carburetor.

Among the features of the Alfa Romeo blower are the use of two different gear ratios, the blower being slightly geared up in relation to the engine, and a free wheel overrunning device allowing the blower to overrun the engine when the latter is cut out. This avoided flat spots in pick up and was valuable on a set of roads calling for a wide range of engine speed.

The Alfa Romeo engineers succeeded in getting a high power output at comparatively low engine speeds. They obtained 100 h.p. at 3000 revolutions and touched the peak of their power curve at rather more than 5000 revolutions. On several other European makes the maximum power was obtained at a much higher number of revolutions, but the greater power gave no advantage, for road conditions did not make it possible to utilize the engines at the highest number of revolutions.

The story of the race is easily told. Kreis took the lead on the second lap, but driving too fast he spun around on one of the curves, was unable to withdraw the clutch and broke the second gear in the transmission.

Milton was delayed a few seconds on the starting line and had to go right through the group of slower 91 in. cars running with the 122 in. models in this race. For twelve laps, (72 miles) he trailed the three Alfa Romeos, then on the thirteenth lap caught up and passed De Paolo. Near thirty laps he was on the tails of the two other Alfa Romeos, and when the Italian cars stopped for gas and tires he went into the lead.

At forty laps, half distance, while still leading, Milton made his first stop or tires and gas, but on the following lap he had to stop again owing to a broken oil line to the right hand camshaft. The repair cost him 26 minutes and removed all chance of winning the race.

In addition to this Milton had broken his right rear shock absorber very early in the race, and had broken the countershaft in his transmission during the fifth lap. He was consequently obliged to run on top, although the course required two gear changes per lap.

The Alfa Romeos had developed a lot of trouble prior to the race and were not running to their usual standard. Milton had the advantage in maximum speed, but with a broken shock absorber his car had a tendency to snake on the turns and his average speed was low on this winding course.

The twenty-six minutes occupied in repairing the broken oil line dropped Milton from the leading position he had occupied for seven laps down to eighth position, behind all the Alfa Romeos and also in the rear of four of the 91 in. Bugattis. Realizing that he had no chance of winning, Milton took things easy from this point on and although he got ahead of the Bugattis again, with the exception of the one driven by Constantini, he did not attempt to beat the Alfa Romeos.

Although running on high the whole time and handicapped by the broken shock absorber, Milton's position relative to the Alfa Romeos never varied a yard over distances of fifty or sixty miles. His engine was pulling perfectly, and had his transmission been equally good he felt he could have made an easy win.

Peter De Paolo, according to his usual practice, turned over the wheel of his car to a relief driver for a few laps in the middle of the race. He had to contend with minor troubles of a mechanical nature and the choke tube of one of the carburetors having become displaced, the entire carburetor had to be changed after about three-quarter distance had been covered. De Paolo never got the lead, his best position in the race being second.

Bugattis Stage Own Race

There was not much competition among the 91 in. cars, excepting that provided among themselves by the four drivers of the Bugatti team.

Two Chiribiris went out rather early, one of them turning over without any damage to the driver. Eldridge, the English driver, came with a car which had never been run and did not endure for more than a dozen laps.

Jules Goux took the lead of the 91 in. group and held it for 450 miles, when he was forced out with broken valves. This gave Constantini, who had been held back at the beginning by spark plug trouble the necessary opportunity to get in the lead. The fastest lap among the 91 in. cars was made by Constantini at 92.91 miles an hour, and his average for the 500 miles was 86.479 miles an hour.

The fastest lap among the 122 in. cars was 3 min., 37 49/100 sec., equal to 104.03 miles an hour, made by Brilli Peri. During practice both Milton and Kreis had turned lap in 3 min. 31 sec. Final results:

1. Brilli Peri, Alfa Romeo (122 inch) ... 5 14 33 33/100
   Average 94.76 miles an hour.
2. Campari, Alfa Romeo (122 inch) 5 35 30 19/100
3. Constantini, Bugatti (91½ inch) 5 44 40 91/100
4. Milton, Duesenberg (122 inch) 5 46 40 46/100
5. De Paolo, Alfa Romeo (122 inch) 5 48 10 27/100
6. Fernard de Vizcaya, Bugatti 5 50 49 39/100
7. Foresti, Bugatti 5 55 18 55/100
8. Pierre de Vizcaya, Bugatti 6 1 32 7/100

Traffic Accidents Being Controlled, Safety Congress Speakers Show

Aroused public opinion working to uniform regulations and to the provision of more modern physical facilities

By Sam Shelton

ALTHOUGH the prevention of motor vehicle accidents on streets and highways continues to be one of the chief concerns of safety organizations everywhere, there was a distinct hopefulness displayed at the Fourteenth National Safety Congress at Cleveland that better traffic conditions are on the way, which should result in an improvement in the accident ratio.

The congress opened Monday, September 28 and continued throughout the week.

Confidence and conviction on the part of the public that the traffic problem can be solved has taken the place of the despair and hopelessness that seemed to surround this subject a few years ago, in the opinion of Thomas P. Henry, president of the American Automobile Association, whose paper on "Safety and the Automobile" was read before the Public Safety section of the congress. This is the basis of Mr. Henry's optimism.

Public Interest in Traffic Congestion

An aroused popular interest in the problem and definite progress by public agencies in relieving traffic congestion were the grounds upon which Col. A. B. Barber, of Washington, D. C., based his hopefulness. Col. Barber, who delivered an address at one of the sessions and entered into the discussions, is a director of the National Conference on Street and Highway Safety, the organization formed by the Hoover Committee on Safety.

Aroused public opinion apparently is working in two directions, according to the views and reports of various officials and safety experts at the convention. One is toward the comprehensive and uniform regulation of traffic throughout the United States and the other is toward providing better and more modern physical facilities to carry the traffic.

On the point of more comprehensive and uniform regulation the congress went on record through the adoption of a resolution favoring the licensing of drivers, "whose qualifications to operate motor vehicles shall have been determined by mental tests and practical demonstrations conducted by competent and honest examiners." The revocation or suspension of such licenses should be provided for, the resolution stated.

Another resolution stated: "It is important that uniform traffic regulations shall be formulated and adopted. Traffic movement should be considered as a State and local problem of engineering importance."

An important step taken by the U. S. Bureau of Public Roads looking toward uniformity of traffic conditions was announced by E. W. James, chief of the division of design of the bureau. This was the adoption by the joint committee appointed by the Secretary of Agriculture of a uniform system of marking United States Highways throughout their length in as many States as they may pass through. This committee has designated certain inter-state highways in the Federal Aid system as United States Highways and these roads are to carry the same numbers and uniform markings from beginning to end.

For marking these roads Mr. James' department has designed a completely standardized set of number plates, direction and distance signs and warning signals. The warning signals designate curves and turns, schools, railway crossings, hills and the like. Each signal has a distinctive shape and symbol in addition to "Turn," "Hill," or other instructional word. It was the sense of the Safety Congress that the universal adoption of these markers on all State highways would be a great help to safety because drivers would soon learn to recognize their meaning at a glance.

It was felt, also, that uniformity in this respect would pave the way for certain other standardization in both traffic rules and road design that would be of tremendous value to all motorists and incidentally to the automotive industry.

Mr. Barber stated that at the next meeting of the National Conference on Street and Highway Safety, which probably will be held in December, the commission of the various States on uniform laws will submit proposed legislation to bring about uniformity in the United States in the registration of motor vehicles, the licensing of drivers and the use of roads.

Some of the physical improvements which are rapidly being worked out to facilitate traffic, especially in and near the large cities where congestion has been at its worst, were mentioned by Mr. Henry. Among these were the widening of intersections, rounding of corners, reparing of street not now used because of poor pavement, and elimination of grade crossings. Mr. Henry also mentioned the tendency to build new roads and streets wider and widen old ones wherever possible.

State Builds Boulevard

Frank F. Rogers, State Highway Commissioner of Michigan, told how that State is building a great boulevard with two 40-foot roadways between Detroit and Pontiac. He showed lantern slides depicting the progress of this great enterprise. Other lantern slides showed the methods generally used now to build paved roads with sufficient right of way and grade to enable widening to at least double capacity when traffic demands.

Means of avoiding motor vehicle and highway accidents were discussed by speakers of national prominence, among them being Rear Admiral William S. Sims of the United

States Navy; John Barton Payne, chairman of the Central Committee of the American Red Cross, and Edward S. Jordan, president of the Jordan Motor Car Co.

All of these speakers emphasized the importance of educating automobile drivers and the whole public in the hazards of the streets and highways and how to avoid them. It was agreed this education should begin in the home and be continued through schools, churches, factories and other places where people gather. It was the opinion of Thomas P. Henry that through constant drilling a safety instinct can be developed that can be depended upon to keep the great majority of persons out of trouble on the highways.

Admiral Sims went a little further and declared automobile drivers are safe only when they have forgotten "how" to drive—that is, the mechanical details of the operation—and have become so proficient that they instinctively and automatically know what to do under all conditions. He cited the methods in the navy where men drill and practice certain operations until they are performed practically automatically with invariable exactness.

"Getting by" on the highways with violation or disregard of traffic laws and regulations was deplored by Mr. Payne, who was Secretary of the Interior in President Wilson's cabinet, and before that for many years a judge and lawyer in Chicago. He declared this disregard for laws and the rights of others is a great cause of accidents.

The motor vehicle has been made so safe in its design and construction that rarely is an accident attributable to any defect in the vehicle itself, Mr. Jordan said. In his opinion the most important safety factors in driving are brakes, steering mechanism, the driver, vision and lights. Other important factors are ample power, ease of shifting gears and sturdy wheels. The congestion of traffic on main highways near large cities on Sundays and holidays causes a great many accidents, he said.

Law Enforcement and Safety

The relation between law enforcement and safety was discussed by Judge Alva R. Corlett, of the Municipal Court of Cleveland. Judge Corlett cited figures to prove his contention that when traffic violators are dealt with leniently fatal motor vehicle accidents increase, and that when stern justice is meted out the deaths on the highways are fewer. From police records he gave the following figures:

Traffic deaths last half of 1921—88.

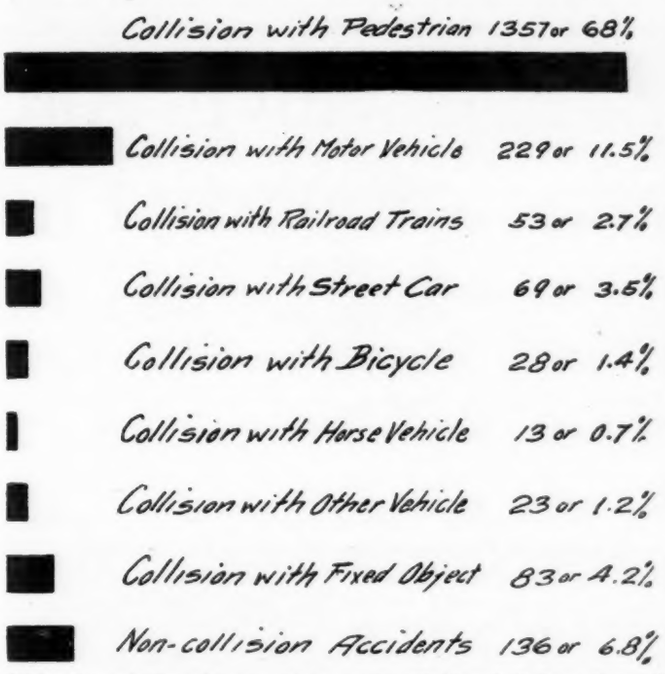
Traffic deaths first half of 1922—48.

Traffic deaths last half of 1922—87.

"In the last half of 1921," he said, "traffic laws were not enforced because traffic officers were withdrawn for strike duty during a milk drivers' strike and there were 88 deaths. The next six months the courts, prosecutors and police co-operated in a policy of strict law enforcement and adequate fines and jail sentences as high as $200 and six months in jail in aggravated cases, and deaths dropped from 88 to 48. Then there came a garbage drivers' strike and traffic officers were again withdrawn for strike duty, and, with the fear of the law absent, deaths increased from 48 to 87. Again during December, 1923, and January, February and March, 1924, when so-called harsh penalties including jail sentences were being imposed, there were 42 deaths as against 89 for the preceding four months when traffic violators were leniently dealt with."

From his long experience in traffic court it was Judge Corlett's opinion that too much speed under the circumstances is the primary cause of traffic accidents, and that congestion is a contributing cause. He believes that a majority of pedestrians are injured through their own carelessness, but that the primary responsibility rests upon the driver because it is he who controls the instrument that does the damage. He advocated making the owner of a car responsible for any damage done by it, regardless of who was driving it.

CLASSIFICATION OF MOTOR VEHICLE FATALITIES


Collision with Pedestrian 1357 or 68%
Collision with Motor Vehicle 229 or 11.5%
Collision with Railroad Trains 53 or 2.7%
Collision with Street Car 69 or 3.5%
Collision with Bicycle 28 or 1.4%
Collision with Horse Vehicle 13 or 0.7%
Collision with Other Vehicle 23 or 1.2%
Collision with Fixed Object 83 or 4.2%
Non-collision Accidents 136 or 6.8%

This chart is based on reports to the National Safety Council for the period January-July inclusive, 1925

The statistical committee of the National Safety Council made its report, estimating that there were nearly 85,000 deaths from fatal accidents in the United States in 1924. The committee reported that during the year there were not less than 17,400 deaths in motor vehicle accidents, not counting the accidents which involved railroad trains and street cars. If these and motorcycle accidents were included, it is estimated the total would reach 20,000.

Following last year's Safety Congress the Committee on Public Accident Statistics developed an accident reporting system and recommended its general use. Suggested record forms were drawn up and submitted to police and other officials in all cities of 25,000 or more population. It was reported that 38 cities already are using or taking steps to use this uniform reporting system, which will give the National Safety Council reliable data for classifying the nature and causes of accidents.

From reports already received for the first half of 1925 certain analyses have been made, including one on the type of motor vehicle involved in accidents. This analysis follows:

Automobile Accidents Involving Personal Injury			
Total cases reported	21,444	799	20,645
Private passenger car	18,468	496	17,972
Truck or commercial	4,245	243	4,002
Taxicab	1,896	67	1,829
Jitney	95	4	91
Bus	156	11	145
Motorcycle	579	16	563

These figures represent the experience of a comparatively few cities and are not put forth as indicative of conditions throughout the country. They show, however, how the Safety Council hopes by means of more complete reports to tabulate and analyze information that will be of value in helping to reduce automotive and other accidents.

Sleeve Valve Aircraft Engine Passes French Endurance Test

450 hp. motor built by Panhard-Levassor Co. is first of Knight type to prove successful in public competition

By W. F. Bradley

A 450-hp. sleeve valve engine built by the Panhard-Levassor Company has successfully accomplished the 240-hour test in the French Government endurance competition for which two million francs have been allotted. It went through the trials on the first attempt, and is now waiting for other engines which failed in the first attempt to complete their second trials.

In case of equality, the engine having been successful on the first occasion takes priority over one having had two trials. This is the first occasion in the world that any other than a poppet valve aviation engine has been successful in a public competition.

The engine is of the Knight sleeve valve type, but embodying many features for which the French firm holds patents. Among the advantages claimed for the sleeve valve over the poppet valve engine is the decreased height.

Height Only 35.4 Inches

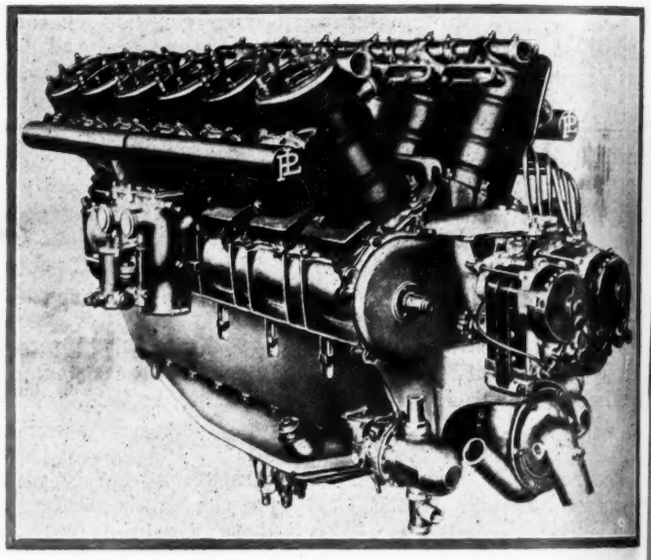
The Panhard-Levassor is a 12-cylinder V at 60 deg., having an overall length, including the propeller boss, of 80.1 in. and a width of 35 in. By reason of the absence of any overhead valve gear the height is only 35.4 in. This compares with 47 to 49 in. for poppet valve overhead camshaft engines of equal power.

Apart from the use of sleeves in place of poppet valves, the outstanding feature of the Panhard-Levassor engine is the white metalling of the inner face of the outer sleeve, and also the white metalling of the walls of the steel cylinders. The Panhard-Levassor Company holds a master patent on the white-metalling of distributor sleeves and has been applying this construction to the whole of its engines for the past two years.

Cylinder dimensions are 5.5 in. by 6.69 in. and the compression ratio is 5.4. The cylinders are steel forgings, with a welded on sheet steel water jacket for each, mounted as close together as possible on an aluminum basechamber. Steel sleeves are used, the thickness of the walls being 1.5 mm., and with a view to the reduction of weight they are drilled and cut away considerably near their base and near their centre.

Advantages of Steel Sleeves

The use of steel in place of cast iron sleeves has been general on Panhard-Levassor engines for the last three years, and has the advantages of lower weight, reduced vibration and economy in oil by reason of the smaller clearances which it renders possible. For a passenger car engine of about 245 cu. in. piston displacement, the weight is reduced by rather more than two-thirds. This weight



Panhard-Levassor 450 hp. sleeve valve aircraft engine

reduction has also been furthered by the adoption of three narrow compression rings on the cylinder head in place of the single deep ring originally used on Knight engines. By reason of this improvement the height of the sleeves is reduced, thus cutting down weight, and there is a further and more important weight reduction by reason of the reduced height of the cylinder. The port area can be increased almost indefinitely without making it necessary to increase the depth of the compression ring in the cylinder head.

Carbureters on Outside

In accordance with French Air Service requirements, all the auxiliaries on the Panhard-Levassor engine are grouped at the rear and the carbureters are on the outside. Spur pinions are used for the auxiliary drives. The engine being a V type, the exhaust is in the angle formed by the two groups of cylinders. A seven bearing crankshaft is used and the eccentric shafts also have seven bearings. The connecting rods are of the tubular forked type, with steel cap white metal bearings. The piston pin is fixed in the rod and revolves in the aluminum alloy piston.

A peculiarity of the water circulating system is the use of a single pump, having one inlet and two outlets and a common inlet and water outlet for the engine cylinders.

From the pump the water is led to the upper edge of the rearmost cylinder, just above the exhaust port. A portion of the water passes in a straight line flow to the outlet from No. 1 cylinder to the radiator, another portion takes a circular path around the cylinder head and there is another current around the cylinder barrels. In addition to reducing the water connections by one-half by having a common inlet and outlet pipe, it is claimed that turbulence is set up which is beneficial to the equal cooling of the cylinders.

Lubrication is of the dry sump type, with a scavenger pump for each end of the engine and a central pressure pump delivering lubricant through oilways in the shaft to the main and connecting rod bearings. In addition to this, there is a separte oil pump for an injection of oil by centrifugal force to the connecting rod bearings. The oil from this auxiliary pump delivers through a distributor to each of the bearings in succession, each one thus receiving the full oil pressure in turn. Injection is made into eccentric collector rings on the crankshaft webs, from which it is delivered by centrifugal force to the connecting rod bearings.

Two twelve cylinder magnetos are used for ignition, each magneto thus being capable of assuring the operation of the engine. There are two vertical Panhard-Levassor carbureters per group of six cylinders, each carbureter being connected to the inner end of a perfectly straight inlet manifold. The advantage of this lies in the grouping of carbureters and the greater convenience in connecting up the gas line. It is claimed that this arrangement, which naturally delivers the mixture first to cylinders 3 and 4 of each group, gives a distribution equally as good as that of the more conventional manifold arrangement.

Starting is assured by compressed air, with a distributor on the rear right-hand side of the engine and a valve in the cylinder head.

Developing 450 hp. at 1500 and 550 hp. at 1800 r.p.m., with a direct drive propeller, the Panhard-Levassor engine weighs 1157 lb. in running order, but without propeller and without tanks.

One Reason Why Production is Holding Up

SCENES like this can be duplicated in almost any part of the united States. These "graveyards" are filled with delapidated and wrecked vehicles which have reached the end of their usefulness. For every machine committed to the "burial ground" a new one is usually called into service and with from 2,000,000 to 3,000,000 cars and trucks going into the scrap pile annually at the present time it is not difficult to see that the industry has a good sized job on its hands meeting the replacement demand alone, without bringing into the picture the hundreds of thousands of new owners which are coming into the field each year.

The salvaging of old cars is an important industry in itself.

Books for the Business Bookshelf

Fuels and Carbureters

THE entire scope of the inter-related subjects, Fuels and Carbureters, is reviewed and discussed in Vol. 4 of The Gasoline Automobile. This volume, by P. M. Heldt, is published as a fitting companion to the earlier series of three volumes dealing with the engine, transmission, mechanism and chassis and electric equipment, respectively, which are well known authorities in the engineering departments and class rooms of the automotive world.

Although carbureters from the earliest prototypes down through many years of development to the most modern design are discussed and illustrated liberally, the feature of the volume is the broad handling of the subject. Fuels are treated in a similar manner, as the discussion is not limited to gasoline but includes kerosene, alcohol, benzol and their various blends as well as producer gas. Sources of these various fuels, with discussion of the potential supply and the producing methods and equipment, both historical and modern, are covered in each instance. Molecular structure and physical characteristics as related to use in the various forms of internal combustion engine are described and analyzed.

Not only is the progress of carbureter design analyzed, but the basic theories involved in jet and similar actions are covered thoroughly with complete information on laboratory instrumentation for all types of tests, including air and fuel metering and exhaust gas analysis. In fact, carburetion is covered from basic theory to operating characteristics, trouble diagnosis and correction. Along with the carburetor are included the rest of the units comprising the fuel system, including gasoline tanks, gauges and reserve compartments, vacuum tanks and strainers. A chapter is devoted to air cleaners and washers and their design and characteristics.

Illustrations and examples are drawn from the best practice both here and abroad. Among the authorities quoted are Lucke, Ricardo, Midgley, Berry and others. The final chapter is devoted to a discussion of combustion and detonation and is followed by an appendix which correlates tables and information of great value in designing, developing and testing carburetors and for testing fuels. The new volume comprises 374 pages with 173 illustrations, which include photos and line drawings of carbureters, and the fuel system with graphs and charts which summarize much of the theoretical information.

In addition to its thorough-going make-up, this volume will be interesting to those inclined to automotive channels for its discriminating discussions and historical references. Furthermore, the theories involved are built up from simple fundamentals in the same manner that characterizes the earlier volumes of the series rather than the empirical methods that are found all too often.

Labor Relations in Industry

THE time is still far distant, if it ever arrives, when the final word can be said in regard to human factors in industry. Man's desires and ambitions are in a constant state of flux so that what may be a satisfactory arrangement between labor and management or capital today may be inadequate tomorrow. For this reason, in spite of the many published works on the subject, each new study usually has something of value to offer as an excuse for its preparation. The subject of labor relations contains so many angles that no work can cover them all completely and new angles are constantly being discovered by later writers who also have the most recent developments in personnel work to draw upon for material.

"Labor Relations in Industry," written by Dwight L. Hoopingarner and published by A. W. Shaw Co., Chicago, is no exception to this rule. The book attempts complete coverage of the subject so that it duplicates to a considerable extent other works. But the author has had the very latest developments in personnel administration to use as text material and also he presents much of the old material in new ways which should offer numerous new suggestions to readers for obtaining greater benefits from their handling of labor problems.

The first part of the book is a general discussion of the broad problems involved and the obvious solutions. This is followed by an outline of actual methods available for controlling labor relations, such as co-operative management, labor unions, etc. Then follow discussions on division of earnings, health conservation special social considerations such as insurance and housing, plant relations focused on an individual plant, and the world scope and trends of labor relations.

Diesel Engine Design and Operation

A PAMPHLET containing a compendium of papers on Diesel Engines, read before the German Association of Engineers at one of its recent meetings, has been issued by the VDI Verlag, G.m.b.H., Berlin SW 19, Germany. All of the papers have been translated into English and some of them have been added to by the authors since they were originally presented before the German society. As may be judged from the following list of subjects, the pamphlet covers both theoretical and practical aspects of the Diesel engine and should interest every one having to do with that particular branch of engineering.

Numerous excellent halftone and line illustrations add to the interest of the work. The list of papers included is as follows: The Diesel Engine of Today, by Prof. Dr.-Ing. Nagel, Dresden (this paper alone is accompanied by 132 illustrations); Hints for the Quantity Production of Small and Medium Size Oil Engines, by F. Schultz, Kolb-Deutz; Liquid Fuels and their Combustion in Diesel Engines, by Chief Engineer Otto Alt. Kiel; Transfer of Heat in the Internal Combustion Engine, by Prof. Dr.-Ing. Wilhelm Nusselt, Karlsruhe; Diesel Engine Research, by Prof. Dr.-Ing. Kurt Neumann, Hanover; Increasing Output in Four-Stroke Cycle Diesel Engines, by Dr. W. Riehm of the Augsburg Works of the M A N.; Remote Disturbances Due to the Vibration of Stationary Engines, Particularly Internal Combustion Engines, by Dr.-Ing. J. Geiger, Augsburg, and Bibliography of the Diesel Engine